PUBLIC ROADS

A JOURNAL OF HIGHWAY RESEARCH

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF PUBLIC ROADS

VOL. 18, NO. 7 ▽ SEPTEMBER 1937

CARS PASSING ON A NARROW ROAD

PUBLIC ROADS ▸▸▸ *A Journal of Highway Research*

Issued by the

UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF PUBLIC ROADS

Volume 18, No. 7 September 1937

The reports of research published in this magazine are necessarily qualified by the conditions of the tests from which the data are obtained. Whenever it is deemed possible to do so, generalizations are drawn from the results of the tests; and, unless this is done, the conclusions formulated must be considered as specifically pertinent only to described conditions.

In This Issue

THE BUREAU OF PUBLIC ROADS - - - - - - - - - Willard Building, Washington, D. C.

REGIONAL HEADQUARTERS - - - - - - - - - - - - Federal Building, Civic Center, San Francisco, Calif.

▼

DISTRICT OFFICES

DISTRICT No. 1. Oregon, Washington, and Montana.
Post Office Building, Portland, Oreg.

DISTRICT No. 2. California, Arizona, and Nevada.
Federal Building, Civic Center, San Francisco, Calif.

DISTRICT No. 3. Colorado, New Mexico, and Wyoming.
254 New Customhouse, Denver, Colo.

DISTRICT No. 4. Minnesota, North Dakota, South Dakota, and Wisconsin.
907 Post Office Building, St. Paul, Minn.

DISTRICT No. 5. Iowa, Kansas, Missouri, and Nebraska.
Masonic Temple Building, Nineteenth and Douglas Sts., Omaha, Nebr.

DISTRICT No. 6. Arkansas, Louisiana, Oklahoma, and Texas.
Room 502, United States Court House, Fort Worth, Tex.

DISTRICT No. 7. Illinois, Indiana, Kentucky, and Michigan.
South Chicago Post Office Building, Chicago, Ill.

DISTRICT No. 8. Alabama, Georgia, Florida, Mississippi, and Tennessee.
Post Office Building, Montgomery, Ala.

DISTRICT No. 9. Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont.
505 Post Office Building, Albany, N. Y.

DISTRICT No. 10. Delaware, Maryland, Ohio, Pennsylvania, and District of Columbia.
Willard Building, Washington, D. C.

DISTRICT No. 11. Alaska.
Room 419, Federal and Territorial Building, Juneau, Alaska.

DISTRICT No. 12. Idaho and Utah.
Federal Building, Ogden, Utah.

DISTRICT No. 14. North Carolina, South Carolina, Virginia, and West Virginia.
Montgomery Building, Spartanburg, S. C.

Because of the necessarily limited edition of this publication it is impossible to distribute it free to any person or institutions other than State and county officials actually engaged in planning or constructing public highways, instructors in highway engineering, and periodicals upon an exchange basis. At the present time additions to the free mailing list can be made only as vacancies occur. Those desiring to obtain PUBLIC ROADS can do so by sending $1 per year (foreign subscription $1.50), or 10 cents per single copy, to the Superintendent of Documents, United States Government Printing Office, Washington, D. C.

CERTIFICATE: By direction of the Secretary of Agriculture, the matter contained herein is published as administrative information and is required for the proper transaction of the public business.

A STUDY OF THE PASSING OF VEHICLES ON HIGHWAYS

By J. T. Thompson, Highway Research Specialist,[1] and Norman Hebden, United States Bureau of Public Roads

THE question of what constitutes suitable or necessary road widths is one of first importance to highway engineers, economists, and administrators. Surface width greatly affects such matters as traffic capacity, highway cost, and safety. In a remarkably short time we have seen widths increase from a scant dozen feet to 20 feet or more for the undivided two-lane pavement and beyond that to multiple-lane arrangements. It is obvious that this increase is the result of the changing character of traffic, but the particular element or elements causing the change—size, speed, or traffic density—has not been determined.

The store of information bearing upon this question is scant—out of proportion to its importance. Various attempts have been made to establish facts, but the investigators have not supplied much of the information needed today in considering the relation of vehicular dimensions and speeds to road widths.

In earlier studies fixed stations were set up on the road at which observers noted the distance from the road edge of vehicles passing the station.[2] Deductions as to the probable transverse positions of vehicles in the most critical state, that is, when passing one another, were accordingly based upon observations involving only one vehicle. It was only by coincidence that simultaneous records of two passing vehicles could be obtained. One exception should be made to this general remark; in the Cleveland study, some data were obtained for passenger cars passing the station simultaneously while traveling in opposite directions.

MOTION PICTURES TAKEN OF PASSING VEHICLES

In the early summer of 1933 the Bureau of Public Roads of the United States Department of Agriculture in cooperation with the Johns Hopkins University, the Commissioner of Motor Vehicles of Maryland, and the State Roads Commission of Maryland,[3] undertook to study this question using a radically different method. It was decided to trail and take motion pictures of vehicles in the act of passing.

The apparatus used in the investigation was simple and needs but little explanation. A motion-picture camera was mounted upon a bracket just outside the driver's window of an automobile as shown in figure 1. This camera was a spring-operated, 35-millimeter machine carrying 100 feet of film at a loading. Exposures were made with a lens having a focal length of 4 inches at the constant rate of 1 foot, or 16 frames, per second. A ratchet-and-pawl arrangement permitted the operator quickly to rewind the camera spring while driving. No serious difficulty was experienced in taking clear pictures.

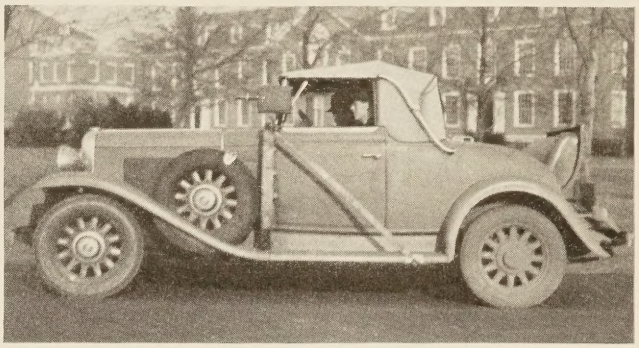

FIGURE 1.—MOTION-PICTURE CAMERA MOUNTED ON AUTOMOBILE USED IN STUDY.

After development, a positive print of the negative was studied in the office by running it through a desk-type, variable-speed machine equipped with a magnifying lens through which the film could be observed as it passed over a translucent plate behind which was a strong light. The frames showing the two vehicles opposite one another in the act of passing were thus identified and marked. (See figs. 2, 3, and 4.) Later, these marked frames were projected upon a screen as still pictures and transverse placement dimensions were scaled off.

It will be helpful to define certain terms that are frequently used in this report.

Critical vehicle—The vehicle being trailed by the observer's car and being passed by another vehicle.

Passing vehicle—The vehicle that passes the critical vehicle.

Lateral position—The transverse position on the road of the vehicles in question when directly opposite one another in the act of passing.

Critical frame—The frame on the film that shows the vehicles at the instant they are opposite each other in the act of passing. This frame is projected to get the required measurements.

Dimension A—The distance from the right edge of the road to the centerline of the right rear wheel of the critical vehicle.

Dimension B—The clearance between the passing and critical vehicles at the instant when their rear wheels are opposite during the act of passing.

Dimension C—The distance from the left edge of the road to the centerline of the outer wheel of the passing vehicle.

Dimension D—The distance center to center of the outer wheels of the passing and critical vehicles.

[1] Also Professor of Civil Engineering, The Johns Hopkins University.

[2] Transverse Distribution of Motor Vehicle Traffic on Paved Highways, by J. T. Pauls, Public Roads, vol. 6, no. 1, March 1925.
Report of a Plan of Highway Improvement in the Regional Area of Cleveland, Ohio, by the Bureau of Public Roads, 1928.

[3] Besides those already mentioned, other cooperating agencies during 1934 were the Pennsylvania Department of Highways, the Department of Revenue of Pennsylvania, the Commissioner of Motor Vehicles of New Jersey, and the Board of Chosen Freeholders of Union County, N. J.

10691—37——1

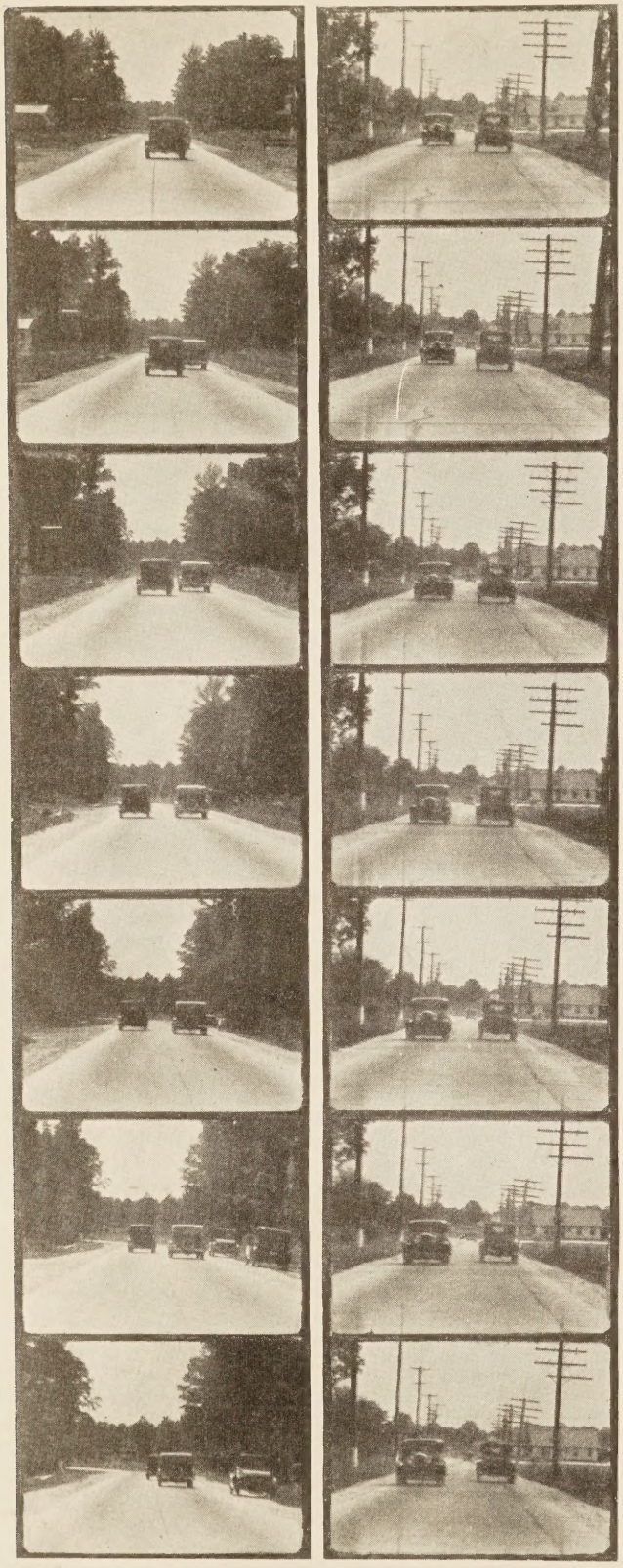

FIGURE 2.—STAGES IN TYPICAL PASSING OPERATIONS. LEFT, PASSENGER CAR PASSING PASSENGER CAR IN THE SAME DIRECTION ON A 20-FOOT ROAD; RIGHT, PASSENGER CAR PASSING PASSENGER CAR IN OPPOSITE DIRECTION ON AN 18-FOOT ROAD.

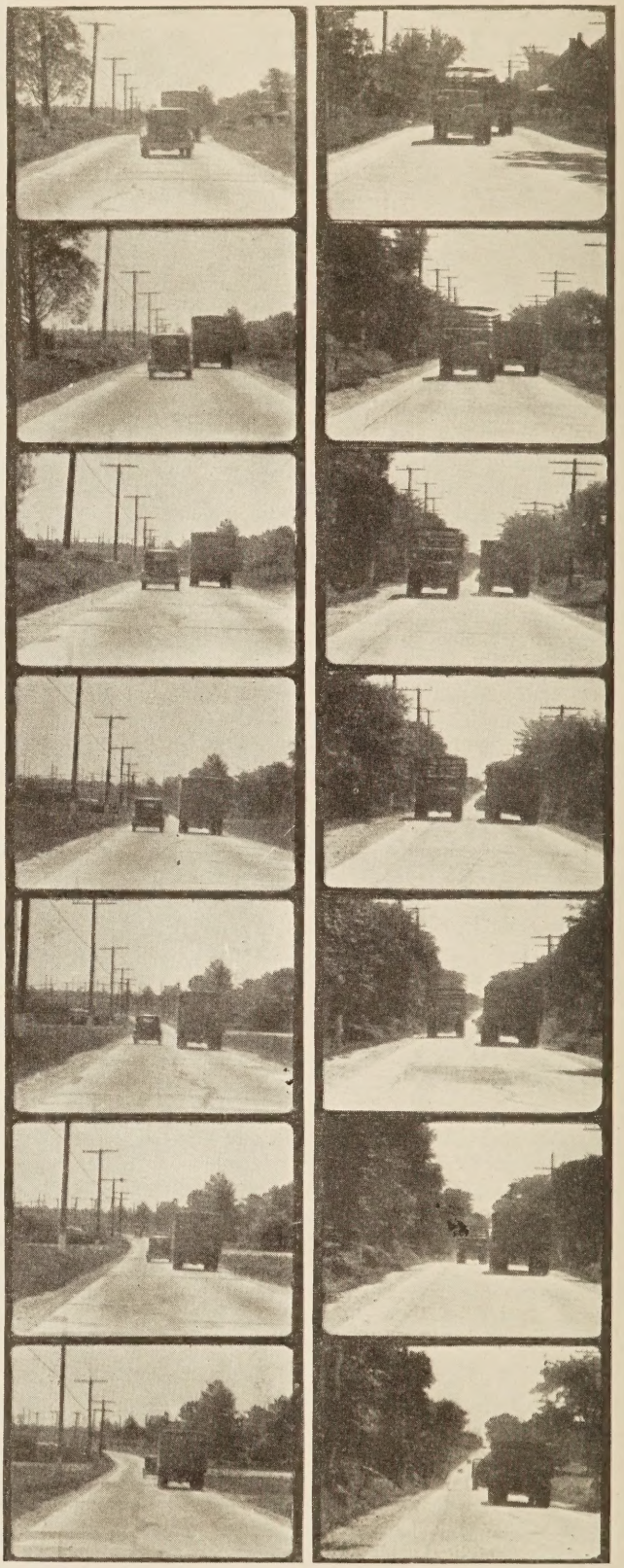

FIGURE 3.—STAGES IN TYPICAL PASSING OPERATIONS. LEFT, PASSENGER CAR PASSING TRUCK IN THE SAME DIRECTION ON AN 18-FOOT ROAD; RIGHT, TRUCK PASSING TRUCK IN THE SAME DIRECTION ON AN 18-FOOT ROAD.

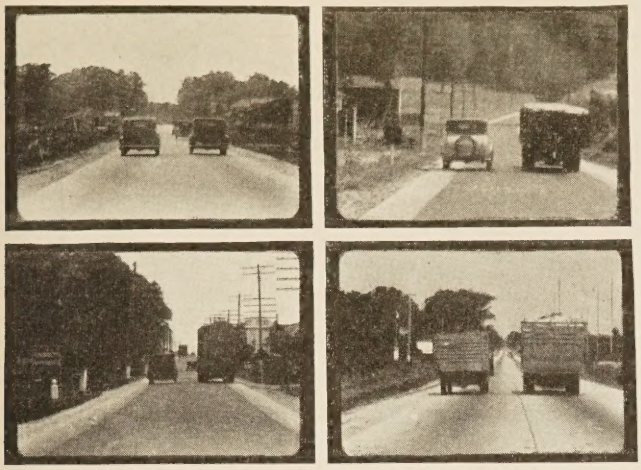

FIGURE 4.—CRITICAL FRAMES OF PASSING OPERATIONS ON 20-FOOT ROADS.

Dimension A+D—The "used space" of road, that is, the distance from the right edge of the road to the centerline of the outer wheel of the passing vehicle.

Dimension E_c—The distance from the right edge of the road to the centerline of the critical vehicle.

Dimension E_p—The distance from the left edge of the road to the centerline of the passing vehicle.

Offset—Distance between centerline of traffic lane and center of vehicle, negative when measured from the lane center toward the road edge, positive when otherwise.

The dimensions defined above apply to vehicles passing while traveling in the same or opposite directions and with the exception of offsets, E_c, and E_p are shown diagrammatically in figure 5.

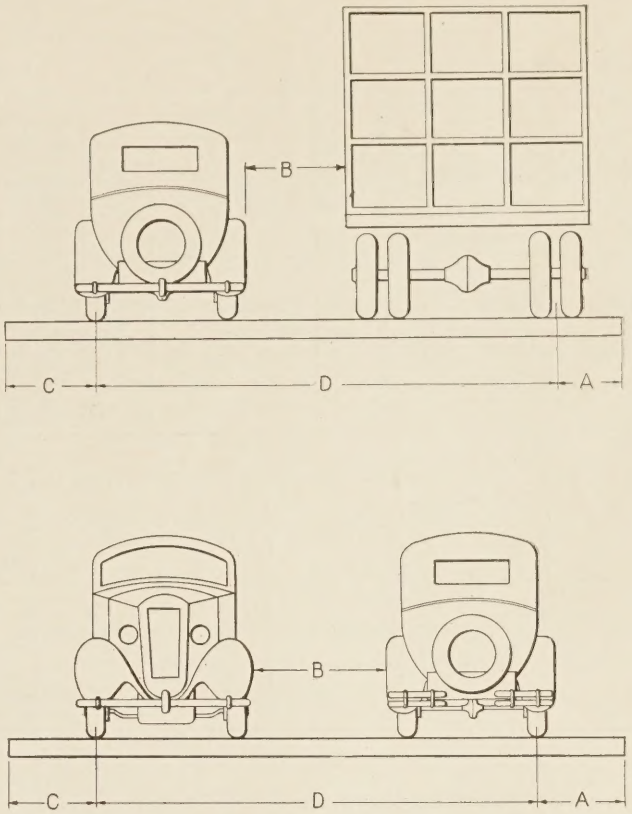

FIGURE 5.—DIMENSIONS USED IN DISCUSSING VEHICLES, PASSING IN SAME AND OPPOSITE DIRECTIONS.

DISTANCES SCALED FROM ENLARGED PICTURES

Table 1 shows a sample of the data recorded in the field and information derived in the office. The field procedure was as follows: The observers placed their car in free traffic and selected a vehicle for observation and followed 200 to 300 feet behind it—near enough to get a useful picture but sufficiently far away to encourage a third vehicle to pull in between. Just as the middle vehicle pulled out to go around the leading one, the camera was started by the driver-observer and a picture of the entire passing maneuver was taken. The observers' car was kept as nearly as possible at the speed of the critical vehicle.

Tests were made in advance of the field work to determine how accurately the trailing speed would represent the speed of the vehicle trailed and it was found that the greatest error over a wide range of speeds did not exceed 5 miles per hour. The speedometer reading was recorded by a second observer who also noted, from stakes set at one-tenth mile intervals, the approximate point of passing. This observation led to a close identification of the point and subsequently notes were made regarding the dimensions of the road, the characteristics of its surface, the shoulders, and wayside conditions.

When the critical vehicle was a truck, it was stopped after the pictures were taken, and its over-all length, width, and distance center to center of tire mountings were measured. No attempt was made to stop the passing vehicle. When the critical vehicle was a passenger car, it was not stopped for measurement because it was felt that for all practical purposes such dimensions could be considered constant.

In obtaining data on vehicles passing from opposite directions, only sufficient film was exposed to determine the lateral positions of the vehicles at the instant of passing. A record of the speed of the critical vehicle and the point of passage was also made.

Positive prints of film were run through a machine designed for use in film editing for the purpose of correlating film "shots" and field notes and selecting the critical frames. At this time decision was made regarding the usefulness of the picture and all observations where the positions were affected by special conditions, such as vehicles parked upon the shoulder or people walking along the side of the road, were eliminated from further consideration.

After the acceptable critical frames had been selected, they were projected upon a screen and the desired dimensions scaled off. Wherever possible, use was made of the known width of the road to establish the scale of the other dimensions. These scaled values were recorded and converted into actual position dimensions as shown in the samples in table 1.

Considerable thought was given the matter of accuracy and tolerance in scaling the dimensions. To insure the best possible accuracy and to act as a check, two different observers made measurements of the clearance, B, on every critical frame. This check and a comparison of A+C+D against the road width as measured in the field, was made in every case to insure accuracy. The tolerances adopted allowed a variation of 0.3 foot in the measurements of clearance, B, and also between the sum of A+C+D and the measured road width. These tolerances amounted to approxi-

TABLE 1.—*Samples of field data and data derived in office*

SAMPLE OF FIELD DATA, LEFT PAGE OF NOTEBOOK

Location: Philadelphia Road Date: July 25, 1933 Party {N. H. W. M.

Serial no.	Weather	Aperture of camera	Passing vehicle: Type	Direction	Approximate station, tenths of miles (maintenance stakes)	Speed miles per hour	Critical vehicle: License no.	Critical vehicle: Type	Critical vehicle: Length	Critical vehicle: Width	Critical vehicle: Center to center of mountings
									Feet	*Feet*	*Feet*
S-145	Bright	15	Passenger	N	35¾ S, 36¾ N	20	Md. 764-T	4 WDT and 2 WDSTr	45.9	8.0	5.95
O-17	do	15	do	N	51¼	40	do	do	45.9	8.0	5.95
S-146	Hazy	13	do	S	17½ N, 15¾ S	35		Passenger			

SAMPLE OF FIELD DATA, RIGHT PAGE OF NOTEBOOK

Serial no.	Point of passing	Road: Type	Road: Over all width	Road: Condition of surface	Paved shoulder: Width	Paved shoulder: Condition	Dirt shoulder: Width	Dirt shoulder: Condition	Remarks on wayside conditions
			Feet		*Feet*		*Feet*		
S-145	36+205	Concrete 15.0	18.0	Rough, patched	R. N. 3 concrete	Fair	R. N. 3	Bad	Deep ditch at 5 feet from road edge.
							L. N. 5	Fair	Deep ditch at 5 feet.
O-17	51+117	do	18.0	Fair	do	do	R. N. 3	Poor	Ditch at 3 feet.
							L. N. 4	do	Ditch at 6 feet, bad edge.
S-146	16+325	Sheet asphalt	20.0	Smooth	2 each 3 feet concrete	Good	R. S. 6	Bad	Ditch at 7 feet.
							L. S. 4	Fair	Mail boxes at 4 to 5 feet.

SAMPLE OF OFFICE DATA

Date: July 3, 1933 Computer: J. J.

Serial no.	Reference	Reference: Actual width	Reference: Projected width	Width of critical vehicle: Projection	Width of critical vehicle: Actual	Width of passing vehicle: Projection	Width of passing vehicle: Actual	Projected distances: A	Projected distances: B	Projected distances: C	Projected distances: D	Actual distances: A	Actual distances: B	Actual distances: C	Actual distances: D
		Feet	*Inches*	*Inches*	*Feet*	*Inches*	*Feet*	*Inches*	*Inches*	*Inches*	*Inches*	*Feet*	*Feet*	*Feet*	*Feet*
S-294	Over-all road width	20.0	9.9	2.9	5.8	2.9	5.8	1.4	2.0	1.3	7.2	2.8	4.0	2.6	14.5
O-337	do	22.0	10.7	2.9	6.0	2.8	5.9	.7	3.6	1.4	8.6	1.3	7.3	2.9	17.8
S-308	do	18.0	13.9	4.6	5.9	4.5	5.8	1.2	3.2	1.3	11.4	1.6	4.1	1.7	14.7

mately 5 percent for the clearance and 2 percent for the sum of A+C+D. A larger tolerance was allowed in the measurement of the clearance because this dimension was the most difficult to scale because of the indistinct outline of the vehicles in the projection when inspected at close range.

PASSING A VEHICLE GOING IN SAME DIRECTION MAKES GREATEST DEMAND FOR ROAD WIDTH

The data obtained are sufficient to indicate the habits of drivers in passing other vehicles going in the same direction and in opposite directions on roadways of widths ranging from insufficient to ample. Widths of 18, 20, and 22 feet, were thought to give such a range. All pictures were taken on undivided, primary highways carrying recreational and commercial traffic. In general, the passing of vehicles was recorded on roads without paved shoulders but some studies were made on roads widened by shoulder paving. Table 2 gives the type, width, and shoulder conditions, on each of the roads where studies were made.

A few of the roads on which observations were made had center stripes painted on the surface to mark the lanes. Most of the concrete roads on which observations were made had longitudinal center joints that also served to mark the common boundary of the two lanes at the center of the road. No effect of the presence of a center stripe upon the position taken by either the critical or the passing vehicle during passing operations was observed.

TABLE 2.—*Description of roads on which observations were made*

Width (feet)	Route no. and location	Year of observation	Description	Dirt shoulder
18	U S 40, vicinity of Aberdeen, Md.	1933–34	Concrete	Poor, 1 to 3 feet wide.
18	U S 111, Maryland line to York, Pa.	1934	do	Do.
18	U S 22, vicinity of Allentown, Pa.	1934	do	Do.
18	U S 40, Baltimore to Aberdeen, Md.	1933	15-foot concrete road, widened with a 3-foot concrete strip on 1 side.	Poor, 1 to 4 feet wide.
20	U S 40, vicinity of Baltimore, Md.	1933	Bituminous concrete with a 3-foot concrete strip on each side.	In built-up section, very narrow.
20	U S 40, vicinity of Aberdeen, Md.	1933–34	Concrete	Fair, 5 to 8 feet wide.
20	U S 22, vicinity of Allentown, Pa.	1934	do	Poor, 3 to 6 feet wide.
22	U S 40, vicinity of Baltimore, Md.	1933	16-foot asphalt with a 3-foot concrete strip on each side.	Poor, 2 to 4 feet wide.
22	U S 111, vicinity of Baltimore, Md.	1933	16-foot bituminous concrete with a 3-foot concrete strip on each side.	Fair, 4 to 8 feet wide.
22	Westfield Ave., vicinity of Rahway, N. J.	1934	Concrete	Excellent, 12 feet wide.

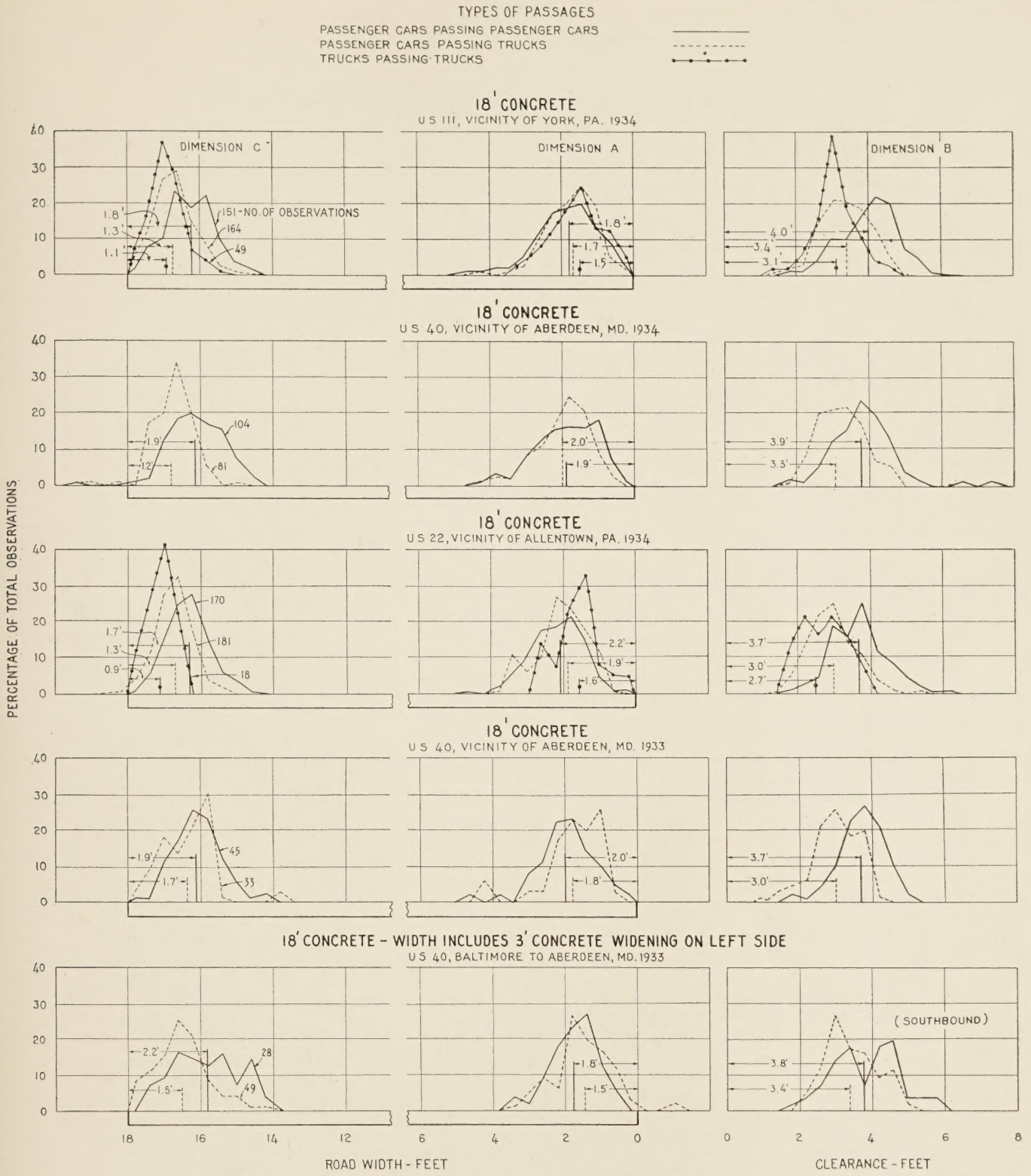

FIGURE 6.—FREQUENCY DISTRIBUTION OF DIMENSIONS A, B, AND C (SEE FIG. 5) FOR SAME-DIRECTION PASSING. NUMBER OF OBSERVATIONS IN EACH SAMPLE INDICATED BY NUMBER AGAINST FREQUENCY DISTRIBUTION LINE.

Overtaking and passing a vehicle going in the same direction is a more difficult operation and imposes a greater demand for road width than meeting and passing a vehicle. In meeting an oncoming vehicle a driver selects a position within the right lane and makes sure that the oncoming vehicle does not tend to infringe upon his lane. Experience has taught that this is the best method to avoid sideswiping. Speed can be regulated according to local conditions. As will be pointed out later, passenger cars do not run off the pavement when passing other passenger cars as is sometimes the case in same-direction passing. In same-direction passing the driver must use that portion of the roadway left to him by the vehicle ahead, dividing his attention

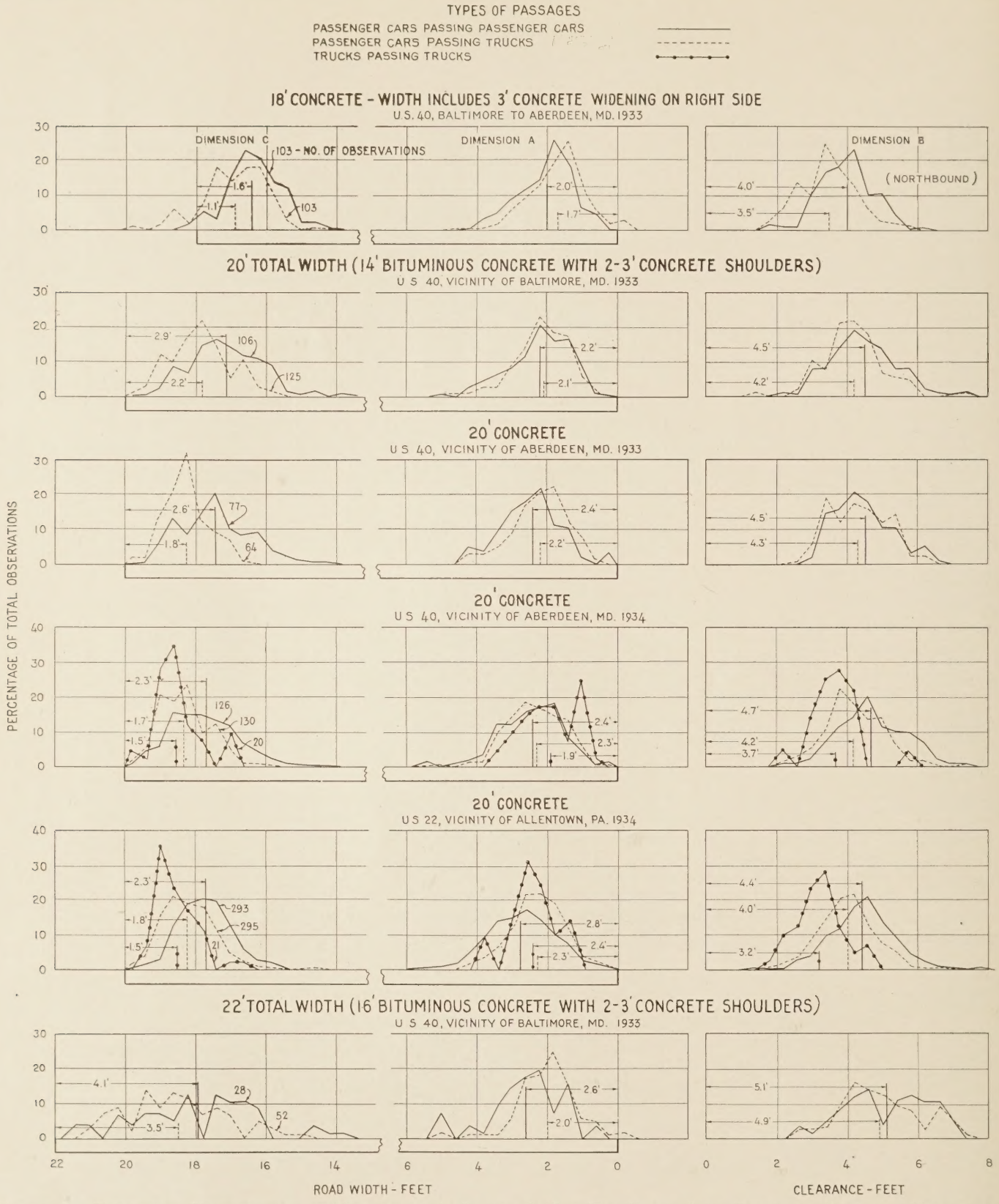

FIGURE 7.—FREQUENCY DISTRIBUTION OF DIMENSIONS A, B, AND C (SEE FIG. 5) FOR SAME-DIRECTION PASSING. NUMBER OF OBSERVATIONS IN EACH SAMPLE INDICATED BY NUMBER AGAINST FREQUENCY DISTRIBUTION LINE.

between clearance with the vehicle on the right and the road edge on the left, and must travel at a speed greater than that of the vehicle being passed.

Figures 6, 7, and 8 show, for same-direction passing, the frequency distribution of edge distance of the vehicles being passed (dimension A), the edge distance

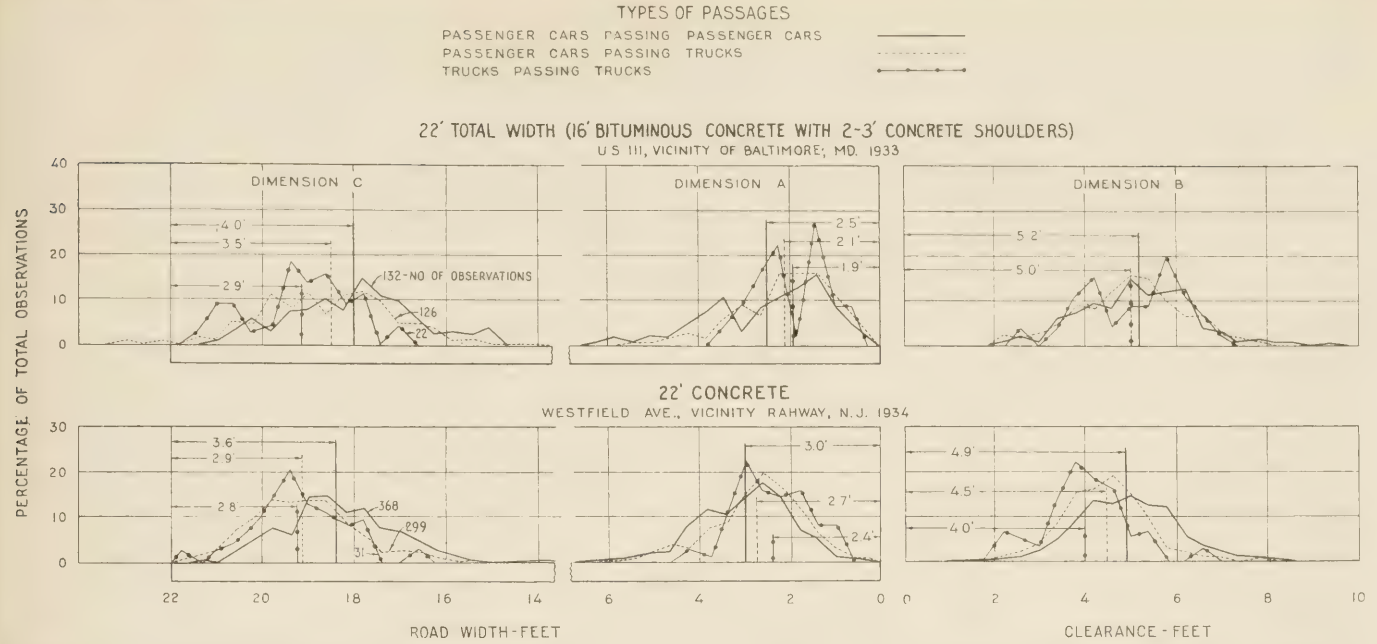

FIGURE 8.—FREQUENCY DISTRIBUTION OF DIMENSIONS A, B, AND C (SEE FIG. 5) FOR SAME-DIRECTION PASSING. NUMBER OF OBSERVATIONS IN EACH SAMPLE INDICATED BY NUMBER AGAINST FREQUENCY DISTRIBUTION LINE.

of the passing vehicles (dimension C), and the clearance between vehicles (dimension B), for each of the roads where studies were made. Passenger cars passing passenger cars are reported separately from passenger cars passing trucks.

In some instances data for trucks passing trucks are shown. Special effort was made to record trucks passing trucks but the number of observations was small, amounting to less than 6 percent of the overtaking passages recorded. This small percentage probably is the result of the relatively small proportion of trucks to total traffic and possibly to the absence of pronounced differences in speed among trucks.

Examination of figures 6 to 8 shows only slight differences in the average positions of vehicles on roads of the same width. For the 18-foot surfaces the frequency distribution lines for dimensions A, B, and C are approximately triangles with narrow bases and high altitudes. With increase in surface width to 20 feet the peaks are somewhat flattened and the bases spread out and this effect is very much more pronounced for 22-foot surfaces. This change in shape of the diagrams is an indication of relief from road-cramping.

Average dimensions from the diagrams for same-direction passing and also those for opposite-direction passing to be presented later, are given in table 3. There is surprisingly little variation in the average dimensions for surfaces of the same width, seldom more than one-half foot. This is about the width of a passenger-car tire and gives confidence as to the adequacy of the methods used.

Table 4 shows the average dimensions consolidated for each width of road but excludes bituminous roads with concrete shoulders and one concrete road widened with a 3-foot strip of concrete. This was done to eliminate the possible influence of paved shoulders on vehicle position. The table is based entirely on observations on 18-, 20-, and 22-foot concrete pavements without special shoulder construction and all conclusions as to vehicle positioning are based upon these consolidated data.

DRIVER PSYCHOLOGY AND RELATION OF ROAD WIDTH TO VEHICLE POSITION INDICATED BY DATA

Table 4 throws light upon several moot questions. For example it has been thought that, perhaps because truck drivers have greater experience and are aware that their vehicles are generally of such width as to cause inconvenience to others, they keep closer to the right edge of the road than do passenger-car operators. Obviously this is not the case as both passenger cars and trucks apparently tend to center themselves closely on the centerline of their own traffic lane and maintain that position when being overtaken and passed. This seems to be true indiscriminately for all three of the road widths studied as the dimensions E_c and the corresponding offsets of critical vehicles show.

One also wonders what drivers want or try to do, either consciously or subconsciously, when they overtake and pass other vehicles. Do they follow the centerline of their own traffic lane if they can? Are they equally concerned with the danger of sideswiping the vehicle they are passing and the hazard of running off onto the left shoulder, and as a result do they bisect the clear space between the vehicle and the road edge?

The answer to the first question is not entirely clear from the data of table 4. In contrast to the positioning of the critical vehicle whose average offset is never greater than 0.2 foot and which is alternately plus and minus, the passing vehicle is consistently to the left of its lane center, except when the relatively small passenger cars are alone involved on the relatively wide 22-foot pavement. In this case the passing vehicles could obviously follow the lane center if they wanted to but instead they apparently are satisfied with a clearance of about 5.0 feet and move well inside the lane centerline.

The answer to the second question seems to be that they are more afraid of sideswiping, since in every case they pass well to the left of the midpoint between critical vehicle and left road edge. This is brought out strikingly by figure 9 which shows diagramatically the positions of the critical and passing vehicles with respect

TABLE 3.—*Average dimensions on individual roads for various types of passages; vehicles moving in either the same or opposite direction*

18-FOOT SURFACES

Road width, feet	Description	Year of observation	Same-direction passing: Passenger cars passing passenger cars: Number of observations	C	E_p	B	A	E_c	Used space	Same-direction passing: Passenger cars passing trucks: Number of observations	C	E_p	B	A	E_a	Used space	Same-direction passing: Trucks passing trucks: Number of observations	C	E_p	B	A	E_c	Used space	Opposite-direction passing: Passenger cars passing passenger cars: Number of observations	A or C	E_c or E_p	Number of observations	B	Opposite-direction passing: Trucks passing trucks: Number of observations	A or C	E_c or E_p	Number of observations	B
				Ft.	*Ft.*	*Ft.*	*Ft.*	*Ft.*	*Ft.*		*Ft.*	*Ft.*	*Ft.*	*Ft.*	*Ft.*	*Ft.*		*Ft.*	*Ft.*	*Ft.*	*Ft.*	*Ft.*	*Ft.*		*Ft.*	*Ft.*	*Ft.*		*Ft.*		*Ft.*	*Ft.*		*Ft.*
18	U S 40, Baltimore-Aberdeen, Md., north-bound, concrete with 3-foot concrete strip on east side	1933	103	1.6	4.0	4.0	2.0	4.4	16.4	103	1.1	3.2	3.5	1.7	4.5	17.0								74	1.9	4.2	37	3.9	38	0.9	3.7	19	3.0
18	U S 40, Baltimore-Aberdeen, Md., south-bound, concrete with 3-foot concrete strip on east side	1933	28	2.2	4.5	3.8	1.8	4.1	15.9	49	1.5	3.6	3.4	1.5	4.3	16.6																	
18	U S 40, vicinity Aberdeen, Md., concrete	1933	45	1.9	4.3	3.7	2.0	4.4	16.2	33	1.7	4.0	3.0	1.8	4.5	16.4								20	1.8	4.2	10	3.8					
18	do	1934	104	1.9	4.2	3.9	1.9	4.2	16.1	81	1.2	3.3	3.3	2.0	4.7	16.8								294	1.8	4.1	147	4.1	128	1.1	4.0	64	2.8
18	U S 111, Maryland line to York, Pa., concrete	1934	151	1.8	4.1	4.0	1.8	4.2	16.3	164	1.3	3.5	3.4	1.7	4.4	16.7	49	1.1	3.5	3.1	1.5	4.2	16.9	398	1.8	4.1	199	4.1	404	1.1	3.9	202	3.1
18	U S 22, vicinity Allentown, Pa., concrete	1934	170	1.7	4.0	3.7	2.2	4.5	16.3	181	1.3	3.5	3.0	1.9	4.8	16.7	18	.9	3.3	2.7	1.6	4.5	17.1	110	2.0	4.4	55	3.5	138	1.2	4.0	69	2.6
	20-FOOT SURFACES																																
20	U S 40, vicinity Baltimore, Md., bituminous concrete with 3-foot concrete strip on each side	1933	106	2.9	5.2	4.5	2.2	4.6	17.1	125	2.2	4.2	4.2	2.1	4.9	17.9								54	2.5	4.8	27	4.8	58	1.6	4.3	29	4.4
20	U S 40, vicinity Aberdeen, Md., concrete	1933	77	2.6	5.0	4.5	2.4	4.8	17.4	64	1.8	4.0	4.3	2.2	4.9	18.2																	
20	do	1934	126	2.3	4.6	4.7	2.4	4.8	17.7	130	1.7	3.9	4.2	2.3	5.1	18.3	20	1.5	4.0	3.7	1.9	4.7	18.5	452	2.2	4.6	226	5.1	172	1.6	4.5	86	3.7
20	U S 22, vicinity Allentown, Pa., concrete	1934	293	2.3	4.7	4.4	2.8	5.2	17.7	295	1.8	4.1	4.0	2.3	5.1	18.2	21	1.5	3.9	3.2	2.4	5.3	18.6	404	2.5	4.9	202	4.5	324	1.7	4.6	162	3.4
	22-FOOT SURFACES																																
22	U S 40, vicinity Baltimore, Md., asphalt with 3-foot concrete strip on each side	1933	28	4.1	6.4	5.1	2.6	4.9	18.0	52	3.5	5.5	4.9	2.0	4.8	18.5																	
22	U S 111, vicinity Baltimore, Md., bituminous concrete with 3-foot concrete strip on each side	1933	132	4.0	6.4	5.2	2.5	4.9	18.2	126	3.5	5.5	5.0	2.1	4.8	18.7	22	2.9	5.0	5.0	1.9	4.7	19.4	132	2.5	4.7	66	6.8	78	1.8	4.4	39	6.1
22	Westfield Ave.—vicinity Rahway, N. J., concrete	1934	368	3.6	6.0	4.9	3.0	5.3	18.4	299	2.9	5.2	4.5	2.7	5.6	19.1	31	2.8	5.3	4.0	2.4	5.4	19.2	496	2.9	5.3	248	5.7	344	2.2	5.2	172	4.3

TABLE 4.—*Weighted average distances on physically similar concrete roads (without paved shoulder) for various types of passages, vehicles moving in either the same or opposite direction*

PASSENGER CARS PASSING PASSENGER CARS

Road width (feet)	Vehicles moving in same direction			Vehicles moving in opposite direction			Vehicles moving in same direction	Vehicles moving in opposite direction	Vehicles moving in same direction			Vehicles moving in opposite direction			Space used by vehicles moving in same direction (A+D)	
	C	E_p	Offset	C	E_p	Offset	B	B	A	E_c	Offset	A	E_c	Offset	A+D	Percentage of road width
	Feet	*Feet*	*Feet*	*Feet*	*Feet*	*Feet*	*Feet*	*Feet*	*Feet*	*Feet*	*Feet*	*Feet*	*Feet*	*Feet*	*Feet*	*Percent*
18	1.8	4.1	−0.4	1.8	4.2	−0.3	3.8	4.0	2.0	4.3	−0.2	1.8	4.2	−0.3	16.2	90.0
20	2.3	4.7	−0.3	2.4	4.7	−0.3	4.5	4.8	2.6	5.0	0	2.4	4.7	−0.3	17.7	88.5
22	3.6	6.0	+0.5	2.9	5.3	−0.2	4.9	5.7	3.0	5.3	−0.2	2.9	5.3	−0.2	18.4	83.6
PASSENGER CARS PASSING TRUCKS																
18	1.3	3.5	−1.0				3.2		1.8	4.6	+0.1				16.7	92.7
20	1.8	4.0	−1.0				4.1		2.3	5.1	+0.1				18.2	91.0
22	2.9	5.2	−0.3				4.5		2.7	5.6	+0.1				19.1	86.9
TRUCKS PASSING TRUCKS																
18	1.0	3.4	−1.1	1.1	3.9	−0.6	3.0	2.9	1.6	4.3	−0.2	1.1	3.9	−0.6	17.0	94.5
20	1.5	3.9	−1.1	1.7	4.2	−0.8	3.5	3.5	2.2	5.0	0	1.7	4.2	−0.8	18.5	92.5
22	2.8	5.3	−0.2	2.2	5.2	−0.3	4.0	4.3	2.4	5.4	−0.1	2.2	5.2	−0.3	19.2	87.1

to the centerlines of traffic lanes and the position of the passing vehicle with respect to the midpoint referred to. Figure 9 is based upon the consolidated data of table 4.

Reference has previously been made to the shape of the distribution diagrams of figures 6, 7, and 8 as an index to the relief from road cramping that is experienced as road widths increase. The reduction in the height of the peaks and the increase in the width of the bases is not nearly so marked between the 18- and 20-foot as between the 20- and 22-foot surfaces.

Other evidence of the greater convenience of traffic on the wider roads also appears in figures 6 to 8. Passenger cars when passing other passenger cars on 18-foot roads were observed in a number of instances to run with their left wheels on the dirt shoulder. This did not happen on either of the two wider roads.

When the average positions of passing vehicles are studied in table 4 or figure 9 very little if any relief from cramping is apparent when the road width increases from 18 to 20 feet. Passenger cars when passing passenger cars can reduce their offset 0.1 foot but there is no change in the offsets of passing vehicles when passenger cars pass trucks or when trucks pass trucks. However, when the road width increases to 22 feet, there is a marked reduction of offsets and all types of vehicles seem to be much more comfortably accommodated. As far as offsets are concerned trucks, when passing trucks on the 22-foot pavement, are able to assume positions at least as favorable as passenger cars passing passenger cars on the 20-foot road and more favorable positions as far as edge distance with respect to the left wheels is concerned.

Figures 10 and 11 show frequency distributions similar to those of figures 6, 7, and 8, except that vehicles are moving in opposite directions. The change in shape of diagrams with increase in road width has a similar significance. It should be noted that no passenger cars were observed to run off on to the dirt shoulder as was the case when they were overtaking and passing other passenger cars on the 18-foot pavement.

The edge distances, positions of vehicle centers, and offsets are also shown for opposite direction passing in table 4. The offsets on all roads and for both types of vehicles are consistently negative. It may be concluded that this displacement to the driver's right is influenced by the presence of the oncoming vehicle since in same direction passing, critical vehicles on the average were seen to track in the center of their traffic lane.

From the foregoing it may be concluded that a pavement width of 18 feet is too narrow for either passenger cars alone or mixed traffic, that pavements 20 feet wide are inadequate for dense traffic involving wide trucks but are reasonably satisfactory for the more lightly traveled roads and for roads used infrequently by wide trucks, and that a width of 22 feet is entirely adequate and satisfactory for mixed traffic.

Speeds of all types of vehicles have steadily increased in the past and there is no definite assurance as to the future trend. It is believed that speed has an effect upon the position of motor vehicles on the pavement. A limited study was made to show the effect of speed upon the position of passenger cars relative to the right edge of the road. Frequency distribution diagrams for same-direction passing were drawn, as shown in figure 13, and the average position with respect to the right road edge was determined for the various speed groups. These positions were taken by the cars as they were being passed by other passenger cars on Westfield Avenue near Rahway, N. J. It is a 22-foot concrete highway. As the speed of the critical vehicle increases, its distance from the right road edge is increased. Additional curves for higher speeds were plotted and they show the same trend, but they are not presented because of the limited number of observations made.

It is felt that, of any effects speed may have upon vehicle position, the primary one is that involving greater edge distance. Thus, further increase in the speeds of vehicles will tend to make additional road width necessary.

10691—37——2

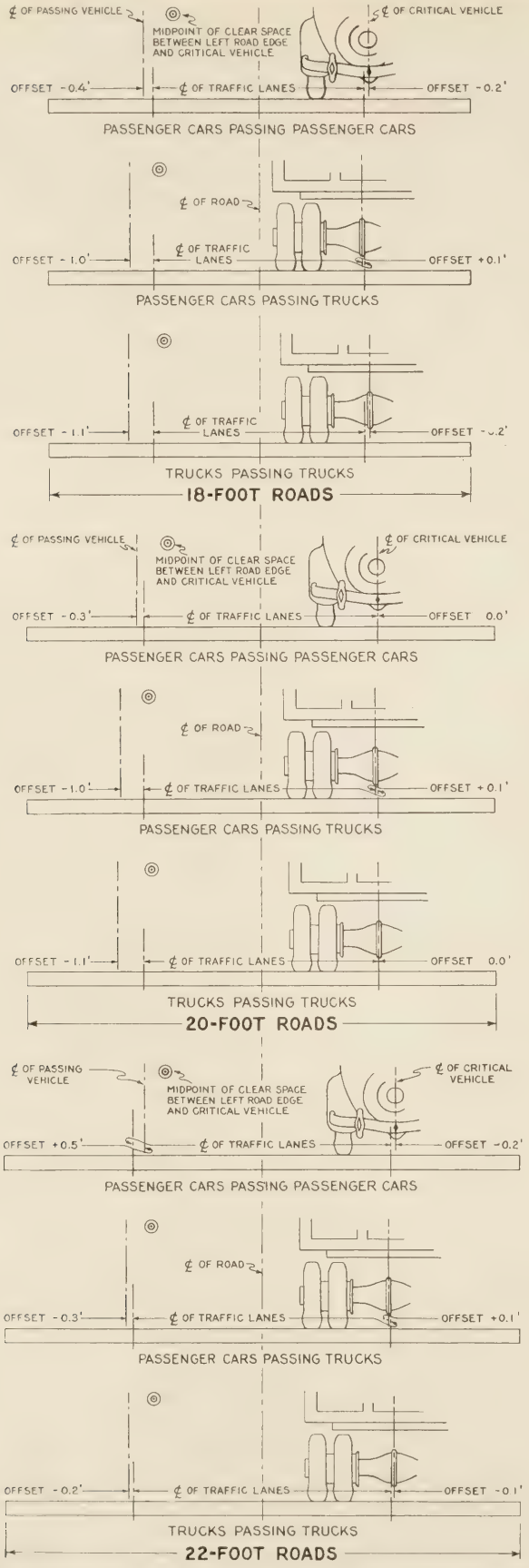

FIGURE 9.—POSITION OF CRITICAL AND PASSING VEHICLES WITH RESPECT TO CENTERS OF TRAFFIC LANES AND CENTER OF MIDPOINT OF CLEAR SPACE BETWEEN LEFT ROAD EDGE AND CRITICAL VEHICLE FOR SAME DIRECTION PASSING. DIMENSIONS ARE WEIGHTED AVERAGES FOR PHYSICALLY SIMILAR CONCRETE ROADS. (WITHOUT PAVED SHOULDERS.)

An interesting and rather surprising fact brought out by this study is the magnitude of the clearances taken by motor vehicles. This holds true for all types of passages whether in same-direction or opposite-direction passing. Quite contrary to the feeling that drivers often have of "just getting by" when they pass other vehicles, the large average clearances observed show that this feeling is generally unwarranted. The suggestion often made that narrow roads would be satisfactory were traffic composed solely of passenger cars is based on the fact that with small edge distances and clearances it is physically possible for vehicles to pass. The facts determined in this study definitely indicate that fairly large edge distances and clearances are desired by vehicle drivers.

TRUCKS CAUSE SMALL INCREASE IN USED WIDTH OF SURFACE

Information on the influence of truck width upon the used width of highways (A+D) has been sought by those studying the allocation of highway costs to the various classes of vehicles. In order to bring out facts in this connection diagrams were drawn for cases in which passenger cars overtook and passed trucks. Each observed A+D dimension was plotted against the corresponding overall width of the critical truck. These data are shown in figure 12. It will be observed that the bulk of the data lies within the 7- to 8-foot range of truck widths, and that outside this range the points become fewer and more scattered. With this observation in mind, and because a recent survey shows approximately two-thirds of all trucks to have widths between 7 and 8 feet,[4] the method of least squares was applied to the data within this range only, to determine the average line.

This analysis is summarized in table 5 in which the increase in used space for a 1-foot increase in truck width is recorded. The results are quite variable but on the average clearly indicate that as truck widths increase, passing passenger cars shift further toward the left edge. The amount they shift, however, is small, 0.1 foot on

TABLE 5.—*Summary showing increase in used space for increase in truck width from 7 to 8 feet for passenger cars passing trucks on concrete roads*

Location of road	Road width	Year of observation	Number of observations	Used space (A+D)		Increase in A+D for 1 foot increase in truck width
				Truck width 7 feet	Truck width 8 feet	
	Feet			*Feet*	*Feet*	*Feet*
U S 40, vicinity Aberdeen, Md.	18	1933	24	16.29	16.57	0.28
U S 40, vicinity Aberdeen, Md.	18	1934	57	16.54	16.82	.28
U S 111, Maryland line to York, Pa.	18	1934	111	16.63	16.76	.13
U S 22, vicinity Allentown, Pa.	18	1934	169	16.73	16.74	.01
Weighted average for 18-foot road				16.64	16.75	.11
U S 40, vicinity Aberdeen, Md.	20	1933	56	17.85	18.51	.66
U S 40, vicinity Aberdeen, Md.	20	1934	98	18.23	18.37	.14
U S 22, vicinity Allentown, Pa.	20	1934	267	17.94	18.29	.35
Weighted average for 20-foot road				18.00	18.34	.34
Westfield Avenue, vicinity Rahway, N. J.	22	1934	147	18.80	19.46	.66

[4] A Study of the Weights and Dimensions of Trucks by J. T. Thompson, Public Roads, vol. 16, no. 3, May 1935.

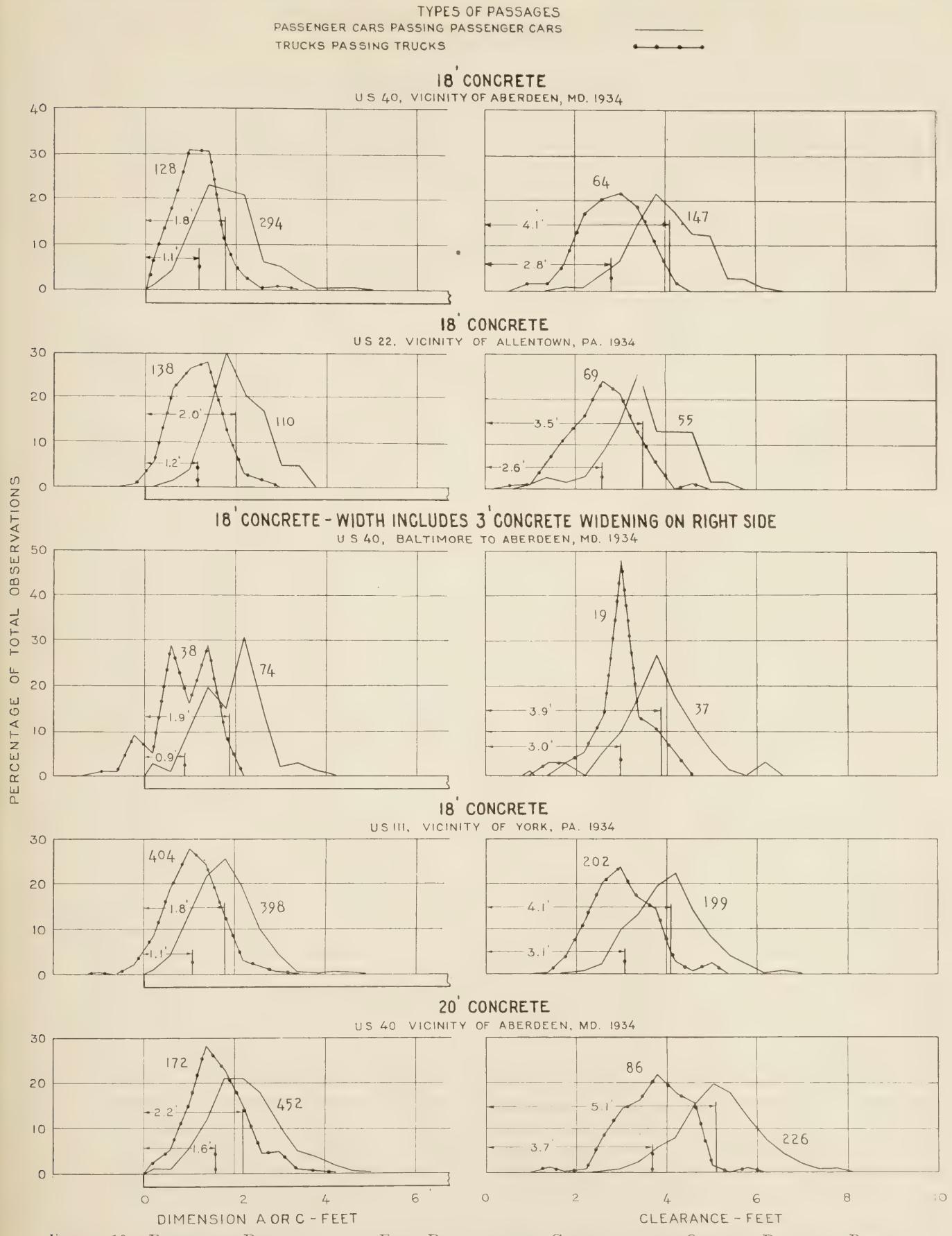

FIGURE 10.—FREQUENCY DISTRIBUTION OF EDGE DISTANCES AND CLEARANCES FOR OPPOSITE DIRECTION PASSING.

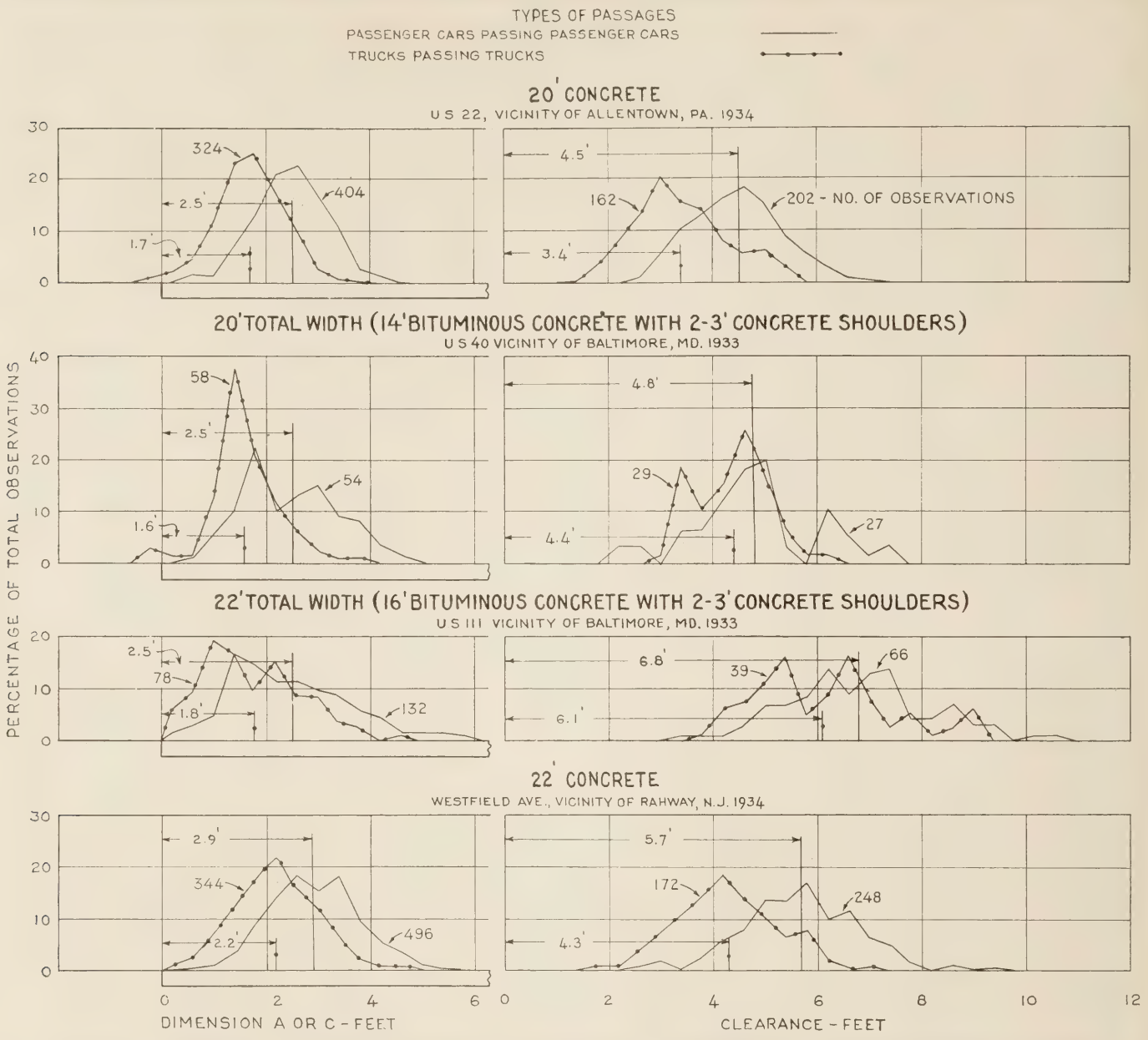

FIGURE 11.—FREQUENCY DISTRIBUTION OF EDGE DISTANCES AND CLEARANCES FOR OPPOSITE DIRECTION PASSING.

the narrow 18-foot road, 0.3 foot on the less restricted 20-foot road, and 0.7 foot on the relatively wide 22-foot road where greater choice is known to exist. This increase in used width of road should not be attributed particularly to trucks of large rated capacity. In the study of truck widths referred to above it was found that wide trucks are approximately evenly distributed among the rated capacity classes from 1½ tons to 5 tons. Eight feet is the common legal maximum width and of observed trucks of this width there were more 1½-ton trucks than 5-ton trucks.

Figures 14 to 19 present additional information on the influence of truck widths on the positions of passenger vehicles in passing trucks. An analysis was made by truck-width classes of the observations in which passenger cars in overtaking and passing trucks were, for any reason, within 1 foot of the left edge of the pavement or off of it entirely. The ends of the horizontal lines shown on the diagrams represent the positions of the right rear wheel of the critical truck and the left rear wheel of the passing car. The average edge distances found for the particular road width is designated, and also the average clearance. Truck widths were broken down into four classes: 6—7, 7—7.5, 7.5—8, and over 8 feet. The information collected on the 18-foot and 20-foot roads is summarized in table 6. The number of observations on 22-foot roads where passenger vehicles, in passing trucks, were within 1 foot of the left edge was negligible.

Table 6 shows that as truck widths increase the percentage of unfavorable left edge distances, as here defined, remains approximately constant. On the 20-foot road, which more nearly approaches a satisfactory width, this is particularly true throughout the range of truck widths, even for trucks exceeding the common legal limit of 8 feet. On the 18-foot road the percentage of such cases remains approximately constant until extralegal widths are reached, when there is a very sudden increase. Few trucks of extralegal width were observed and the sample is rather small to be considered a basis for definite conclusions.

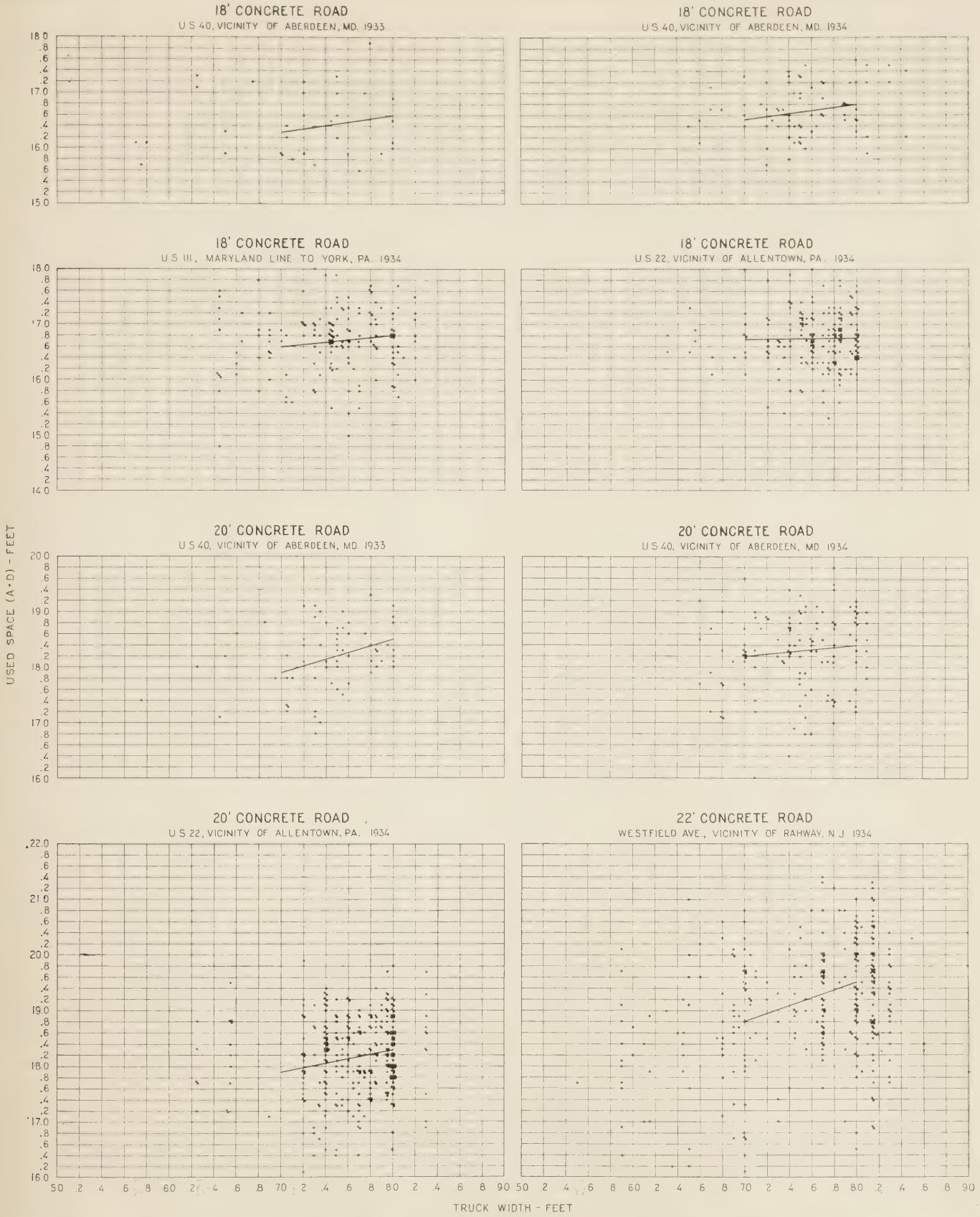

FIGURE 12.—TRUCK WIDTHS COMPARED WITH USED SPACE FOR PASSENGER VEHICLES PASSING TRUCKS IN SAME DIRECTION. INDIVIDUAL CASES PLOTTED AND TREND LINE DETERMINED BY METHOD OF LEAST SQUARES.

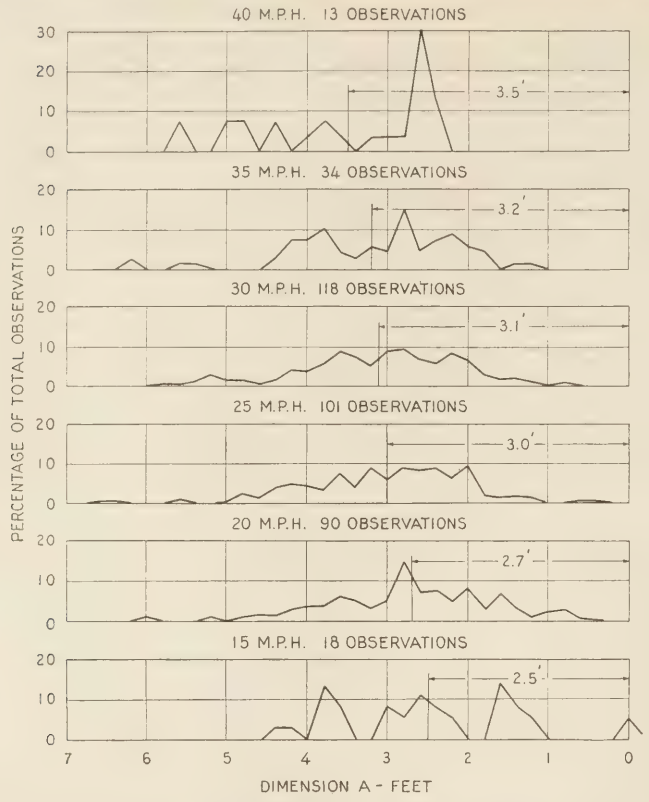

FIGURE 13.—AVERAGE POSITION OF OUTER WHEEL OF CRITICAL VEHICLE FROM RIGHT EDGE OF ROAD (DIMENSION A) AT VARIOUS SPEEDS. WESTFIELD AVENUE 22-FOOT CONCRETE ROAD.

TABLE 6.—*Results of analysis of passenger cars passing trucks of various widths where passing vehicle was within 1 foot of the left road edge or off the road* [1]

18-FOOT CONCRETE ROAD

Truck width (feet)	Number of observations of passenger cars passing trucks in each width class	Percentage of total	Observations where the passing vehicle was within 1 foot of left edge or off road	
			Number	*Percent*
6.0–7.0	67	15	18	27
7.0–7.5	138	32	47	34
7.5–8.0	213	48	66	31
Over 8.0	23	5	11	48
Total	441	100	142	32

20-FOOT CONCRETE ROAD

6.0–7.0	45	9	6	13
7.0–7.5	157	33	21	13
7.5–8.0	258	54	36	14
Over 8.0	20	4	3	15
Total	480	100	66	14

[1] Tabulation for 22-foot road omitted because of the small number of observations where the vehicle was within 1 foot of the left edge or off the road.

From the foregoing it may be argued that the width of the truck is of less importance, comparatively, than the use of excessive right edge distance, excessive clearance, or a combination of the two in causing the passing vehicle to travel close to the left edge of the pavement.

Detailed study of figures 14 to 19 shows that, in general, where less than normal clearance between vehicles was found, the passing vehicle was forced over by the selfish position taken by the passed vehicle. In

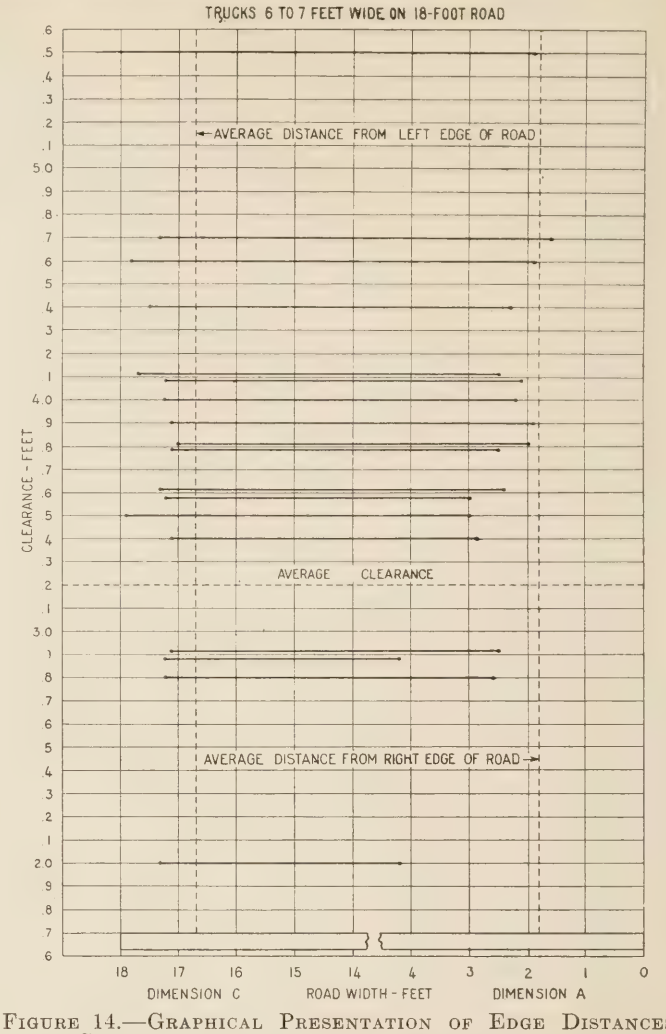

FIGURE 14.—GRAPHICAL PRESENTATION OF EDGE DISTANCES AND CLEARANCE WHERE PASSENGER VEHICLES, IN OVERTAKING AND PASSING TRUCKS, PLACED THE LEFT WHEEL WITHIN 1 FOOT OF THE EDGE OF PAVEMENT. THE ENDS OF THE HORIZONTAL LINES SHOW THE POSITION OF THE RIGHT REAR WHEEL OF TRUCKS AND OF THE LEFT REAR WHEEL OF THE PASSENGER VEHICLES. THE AVERAGE DISTANCES SHOWN BY DASH LINES ARE FOR ALL OBSERVATIONS OF PASSENGER VEHICLES PASSING TRUCKS ON 18-FOOT PAVEMENTS REGARDLESS OF DISTANCES TO EDGES.

nearly all passings observed, where the clearance between vehicles was less than the average, the critical vehicle was taking more than the average edge distance. However, examination of those passings where the passing vehicle was close to the left edge shows more cases where the average clearance between vehicles was exceeded than there were below the average clearance. This suggests that about as many drivers run close to the left edge or off the road because of their own driving habits as are forced to by drivers of passed vehicles.

A comparison of the road width used in passing (A+D) in table 4 shows that passenger cars passing passenger cars used 0.8 foot less space than trucks passing trucks on each of the three road widths. Passages involving trucks and passenger cars required an intermediate amount of space.

The last column in table 4 shows the used space expressed as a percentage of road width. As the road width increases there is, for each vehicle class, a decrease of about 2 percent between the 18- and the 20-

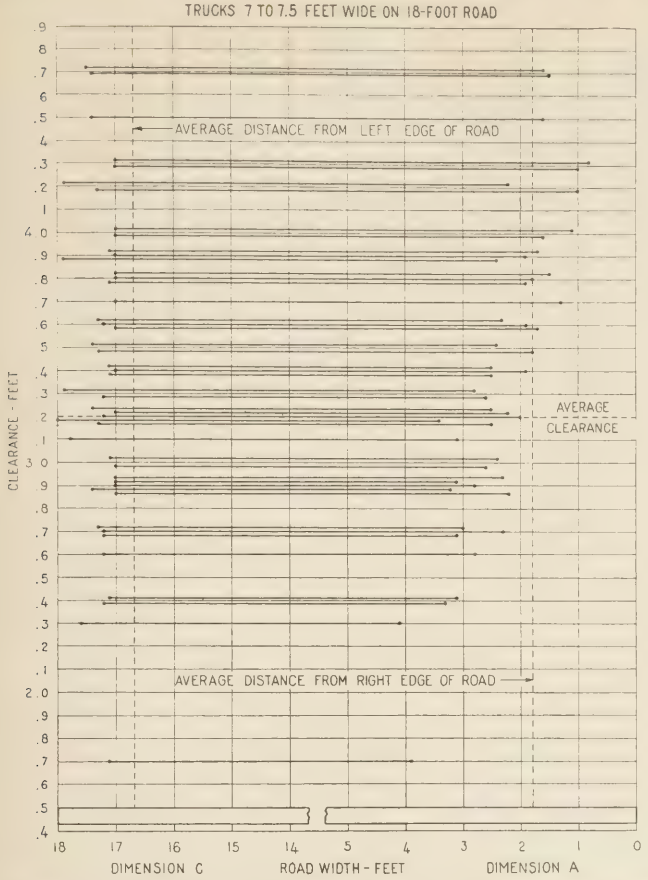

FIGURE 15.—GRAPHICAL PRESENTATION OF EDGE DISTANCES AND CLEARANCE WHERE PASSENGER VEHICLES, IN OVERTAKING AND PASSING TRUCKS, PLACED THE LEFT WHEEL WITHIN 1 FOOT OF THE EDGE OF PAVEMENT. THE ENDS OF THE HORIZONTAL LINES SHOW THE POSITION OF THE RIGHT REAR WHEEL OF TRUCKS AND OF THE LEFT REAR WHEEL OF THE PASSENGER VEHICLES. THE AVERAGE DISTANCES SHOWN BY DOTTED LINES ARE FOR ALL OBSERVATIONS OF PASSENGER VEHICLES PASSING TRUCKS ON 18-FOOT PAVEMENTS REGARDLESS OF DISTANCES TO EDGES.

foot width followed by a much larger decrease between the 20- and 22-foot widths. This is again indicative of narrowness in the 18- and 20-foot roads and also of the release from width restriction that is experienced when a width of 22 feet is reached.

Figure 20 shows passenger cars passing on a 20-foot road.

CONCLUSIONS

1. Drivers of critical vehicles when being overtaken and passed tend to follow the centerline of their own traffic lane very closely.

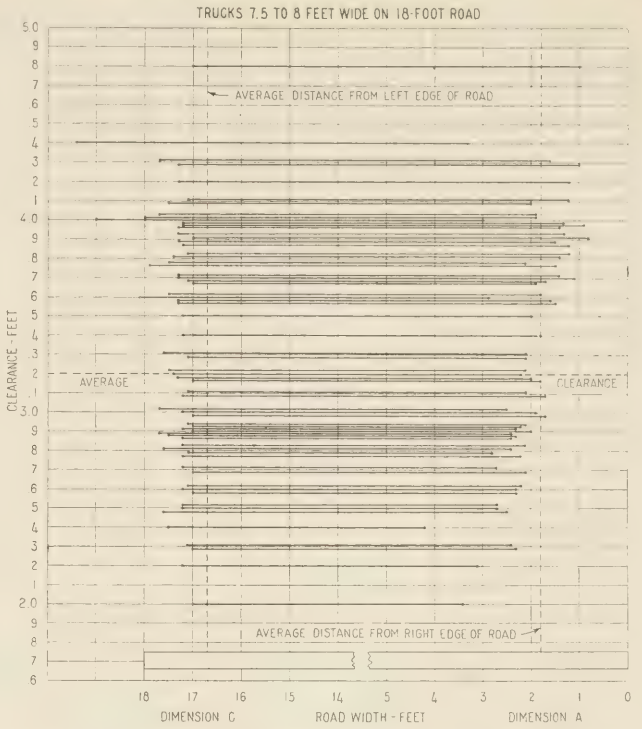

FIGURE 16.—GRAPHICAL PRESENTATION OF EDGE DISTANCES AND CLEARANCE WHERE PASSENGER VEHICLES, IN OVERTAKING AND PASSING TRUCKS, PLACED THE LEFT WHEEL WITHIN 1 FOOT OF THE EDGE OF PAVEMENT. THE ENDS OF THE HORIZONTAL LINES SHOW THE POSITION OF THE RIGHT REAR WHEEL OF TRUCKS AND OF THE LEFT REAR WHEEL OF THE PASSENGER VEHICLES. THE AVERAGE DISTANCES SHOWN BY DOTTED LINES ARE FOR ALL OBSERVATIONS OF PASSENGER VEHICLES PASSING TRUCKS ON 18-FOOT PAVEMENTS REGARDLESS OF DISTANCES TO EDGES.

2. Pavements of 18-foot width are too narrow for modern passenger cars alone or for modern mixed traffic. Pavements of 20-foot width are reasonably adequate for light-traffic roads used infrequently by wide trucks but are inadequate for heavy mixed traffic. Pavements of 22-foot width are entirely adequate for modern mixed traffic.

3. When passenger cars occupy unfavorable positions with respect to the left road edge in passing trucks, they do so because of the habits of the drivers as often as because of their being crowded over by the passed vehicle.

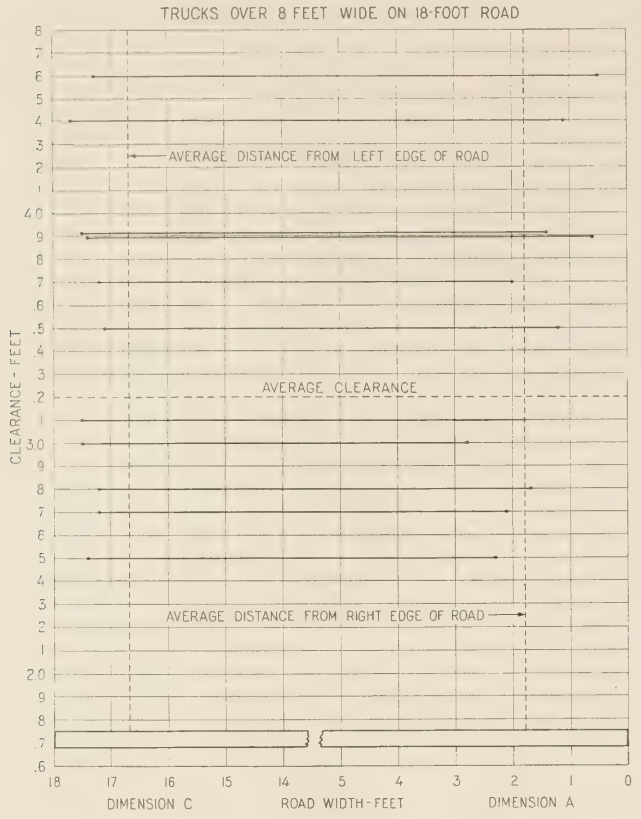

FIGURE 17.—GRAPHICAL PRESENTATION OF EDGE DISTANCES AND CLEARANCE WHERE PASSENGER VEHICLES, IN OVERTAKING AND PASSING TRUCKS, PLACED THE LEFT WHEEL WITHIN 1 FOOT OF THE EDGE OF PAVEMENT. THE ENDS OF THE HORIZONTAL LINES SHOW THE POSITION OF THE RIGHT REAR WHEEL OF TRUCKS AND OF THE LEFT REAR WHEEL OF THE PASSENGER VEHICLES. THE AVERAGE DISTANCES SHOWN BY DOTTED LINES ARE FOR ALL OBSERVATIONS OF PASSENGER VEHICLES PASSING TRUCKS ON 18-FOOT PAVEMENTS REGARDLESS OF DISTANCES TO EDGES.

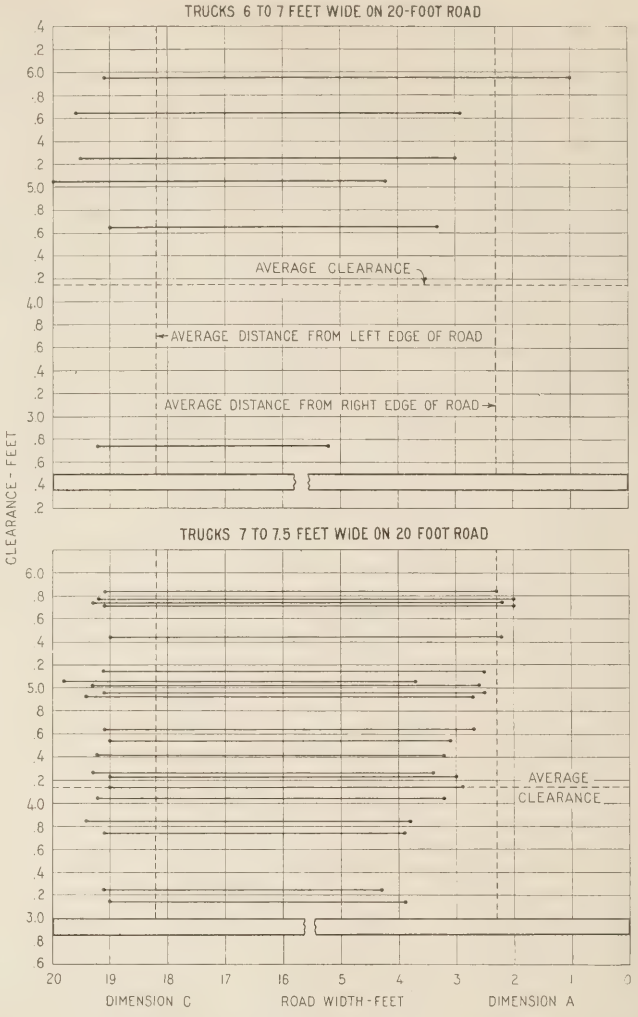

FIGURE 18.—GRAPHICAL PRESENTATION OF EDGE DISTANCES AND CLEARANCE WHERE PASSENGER VEHICLES, IN OVERTAKING AND PASSING TRUCKS, PLACED THE LEFT WHEEL WITHIN 1 FOOT OF THE EDGE OF PAVEMENT. THE ENDS OF THE HORIZONTAL LINES SHOW THE POSITION OF THE RIGHT REAR WHEEL OF TRUCKS AND OF THE LEFT REAR WHEEL OF THE PASSENGER VEHICLES. THE AVERAGE DISTANCES SHOWN BY DOTTED LINES ARE FOR ALL OBSERVATIONS OF PASSENGER VEHICLES PASSING TRUCKS ON 20-FOOT PAVEMENTS REGARDLESS OF DISTANCES TO EDGES.

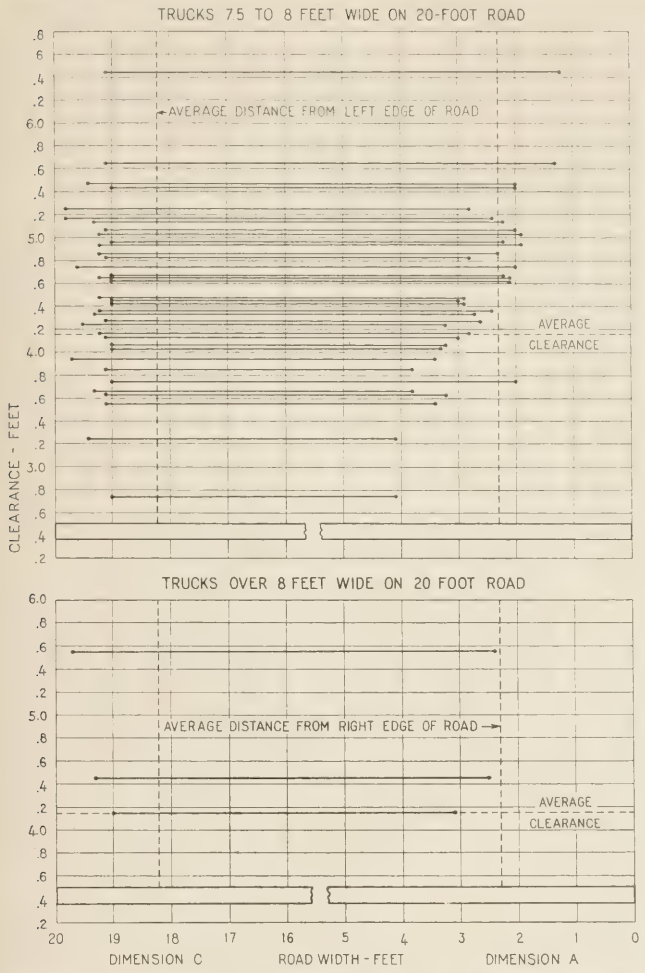

FIGURE 19.—GRAPHICAL PRESENTATION OF EDGE DISTANCES AND CLEARANCE WHERE PASSENGER VEHICLES, IN OVERTAKING AND PASSING TRUCKS, PLACED THE LEFT WHEEL WITHIN ONE FOOT OF THE EDGE OF PAVEMENT. THE ENDS OF THE HORIZONTAL LINES SHOW THE POSITION OF THE RIGHT REAR WHEEL OF TRUCKS AND OF THE LEFT REAR WHEEL OF THE PASSENGER VEHICLES. THE AVERAGE DISTANCES SHOWN BY DOTTED LINES ARE FOR ALL OBSERVATIONS OF PASSENGER VEHICLES PASSING TRUCKS ON 20-FOOT PAVEMENTS REGARDLESS OF DISTANCES TO EDGES.

FIGURE 20.—PASSING OPERATIONS ON A 20-FOOT ROAD.

PUBLICATION ON HIGHWAY BRIDGES AVAILABLE

"Highway Bridge Surveys", a booklet which describes with clarity and in complete detail the importance of the various kinds of data needed in the design of bridges, is being reprinted by the Superintendent of Documents and will soon be available.

The importance of a comprehensive and accurate bridge survey can hardly be overemphasized, the booklet states. Incomplete or inaccurate information may quickly result in bridge failure, involving financial loss as well as possible loss of human life. All pertinent data for each bridge should be obtained and filed, as each structure built may be considered to constitute a practical experiment in bridge building. Such service records furnish additional data that further advance the art of bridge building.

Civil engineering instructors and students will find this publication invaluable as an exhaustive but concise textbook, complete with sample forms for recording data, illustrations, diagrams, necessary formulas, etc.

Written by Mr. C. B. McCullough, an outstanding authority on bridges, this 76-page booklet was first issued several years ago. Published as United States Department of Agriculture Technical Bulletin No. 55, "Highway Bridge Surveys" may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 20 cents per copy. A 25-percent price reduction can be obtained on single orders for 100 or more copies.

DISPOSITION OF STATE MOTOR-FUEL TAX RECEIPTS, 1936

[Compiled for calendar year from reports of State authorities]

State	Net total receipts of calendar year	Adjustments due to undistributed balances, etc.[1]	Net total funds distributed[2]	Expenses of collection and administration	For other administrative purposes[3]	For State highway purposes							For local roads and streets[6]				For other highway purposes (park and forest roads, etc.)	For nonhighway purposes					
						Construction, maintenance, and administration[4]	State highway police	Service of State highway obligations				Total for State highway purposes	For work on county and local roads	For work on city streets[7]	Service of local highway obligations	Total		To general funds[8]		For relief of unemployment or destitution	For education	For other purposes	Total
								State highway bonds	State-assumed local obligations[5]	Notes and other short-term loans	Total							Inspection fees, dealers' licenses, etc.[9]	Motor-fuel tax				
	1,000 dollars	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*
Alabama	11,803	−78	11,725	51	49	4,374		1,508			1,508	5,882	5,743			5,743							
Arizona	3,843		3,843	63		2,533	91					2,624	*1,149			1,149						[10] 7	7
Arkansas	9,235	−23	9,212	341	3	2,292		3,536	2,249	58	5,843	8,135	572		84	656		77					77
California	43,008	330	43,338	139		28,547						28,547	*10,713	3,939		14,652							
Colorado	6,833	−10	6,823	99	4	4,733	179					4,912	[11] 1,808			1,808							
Connecticut	8,835	−182	8,653	51		7,930			672		672	8,602											
Delaware	1,856		1,856	12		1,035	119	45	325		370	1,524	[12] 320			320							
Florida	20,317	−15	20,302	19	358	8,360	146		2,846		2,846	11,352	12		5,693	5,705			2,846			[13] 22	2,868
Georgia	17,493		17,493	522		8,853			2,403		2,403	11,256	2,814			2,814					2,901		2,901
Idaho	3,696	−12	3,684	13		3,671						3,671											
Illinois	33,819	7	33,826	175	261	11,097						11,097	*7,658	7,422		15,080		99		4,417	2,697		7,213
Indiana	21,154	−2,857	18,297	84	70	7,449						7,449	8,245	2,061		10,306		388					388
Iowa	12,196	5	12,201	78	23	3,470			3,250		3,250	6,720	*5,380			5,380							
Kansas	9,520	−61	9,459	314	102	5,898	12		681		681	6,591	2,452			2,452							
Kentucky	11,277	253	11,530	35		11,402	49					11,451	44			44							
Louisiana	12,207	−939	11,268	94				7,687			7,687	7,687								1,576	956	[14] 955	3,487
Maine	5,202	57	5,259	16		3,172	150	1,411			1,411	4,733	510			510							
Maryland	8,921		8,921	34		3,107		1,534			1,534	4,641	993	2,667	572	4,232						[15] 14	14
Massachusetts	18,448	15	18,463	50		7,414	255	1,319			1,319	8,988	2,879		353	3,232	[16] 751		3,650	[17] 1,792			5,442
Michigan	25,739	−141	25,598	141		15,182		3,720			3,720	18,902	*6,550			6,550		5					5
Minnesota	12,329	−85	12,244	113		8,435	192					8,627	*3,421			3,421		83					83
Mississippi	9,062	−228	8,834	75	56	2,905	30	1,761		236	1,997	4,932	*3,753			3,753	18						
Missouri	11,188		11,188	55	50	6,794	148	4,075			4,075	11,017						66					66
Montana	4,455	−149	4,306	22		4,150		134			134	4,284											
Nebraska	11,320	−30	11,290	102		5,594						5,594	*3,022	334		3,356				2,238			2,238
Nevada	1,080		1,080	3		1,044	19		14		14	1,077											
New Hampshire	3,181	−1	3,180	[18]		2,105		800			800	2,905	133		[19] 142	275							
New Jersey	19,106	1,432	20,538	121		2,051		7,636			7,636	9,687	3,120		345	3,465	16			5,388	1,285	[20] 576	7,249
New Mexico	3,410	−25	3,385	75		1,746		1,564			1,564	3,310											
New York[21]	55,709	1,060	56,769	91		5,544	599	3,874			3,874	10,017	*8,104			8,104			[22] 38,557				38,557
North Carolina	20,961		20,961	[23]	30	4,972	203	6,641	407		7,048	12,223	[12] 6,672			6,672		932	1,104				2,036
North Dakota	2,301	30	2,331	25	56	1,476	24					1,500	750			750							
Ohio	[24] 43,450	203	43,653	188		18,062						18,062	7,882	[25] 6,376		14,258					11,145		11,145
Oklahoma	13,216	−62	13,154	264		5,777						5,777	*3,231			3,231		5				[26] 3,877	3,882
Oregon	9,218	−69	9,149	34		4,523	203	2,976			2,976	7,702	*1,179			1,179	59		175				175
Pennsylvania	49,383	[27] −4,646	44,737	257		21,147	862	2,807			2,807	24,816	*6,021	1,192		7,213	62			12,219		[28] 170	12,389
Rhode Island	2,230	1	2,231	14		1,095	77	132			132	1,304					13		607	293			900
South Carolina	9,695	−9	9,686	[29] 41	[29] 12	1,902		1,037	4,968		6,005	7,907	*1,579			1,579		147					147
South Dakota	4,186	−3	4,183	47	118	1,833						1,833					54						
Tennessee	18,158	−93	18,065	181	93	2,046		4,928	2,372		7,300	9,346	4,842			4,842		938				[30] 2,131	2,131
Texas	38,471	−691	37,780	552		18,614			9,307		9,307	27,921										[31] 2,665	3,603
Utah	3,088	−26	3,062	7	4	2,908	143					3,051									9,307		9,307
Vermont	2,277	−117	2,160	3		1,159		333			333	1,492	655			665							
Virginia	14,714		14,714	[23]	29	7,972			552		552	8,524	[32] 6,157			6,157						[33] 4	4
Washington	14,345	2	14,347	24		3,722		[34] 112			112	3,834	*7,812	1,644	[34] 91	9,547				[31] 942			942
West Virginia	6,810		6,810	12		1,769		5,029			5,029	6,798											
Wisconsin	18,028	−1,156	16,872	63	197	6,784			2,382		2,382	9,166	4,465	753		5,218	86		[35] 2,142				2,142
Wyoming	2,254	−32	2,222	12		1,507	36	112			112	1,655	555			555							
District of Columbia	2,393	−1	2,392	[36]										2,382		2,382		10					10
Total	691,420	−8,346	683,074	4,712	1,515	288,155	3,537	64,711	32,428	294	97,433	389,125	131,205	28,770	7,280	167,255	1,059	2,750	49,081	28,865	28,291	10,421	119,408

[1] Amounts distributed during the calendar year differ in many cases from actual collections because of undistributed balances and lag between accounts of collecting and expending agencies. Adjustments also include deduction of proceeds of tax on gasoline used in aviation in Idaho, Michigan, Nebraska, Oregon, South Carolina, and Wyoming.

[2] In many States the proceeds of motor-fuel taxes, motor-vehicle fees, and motor-carrier taxes are placed in a common fund from which the distribution is made. In these cases the amounts distributed have been prorated in proportion to the receipts, not otherwise dedicated, from these 3 sources of revenue. See tables pages 140 to 143.

[3] Where reported separately from collection expenses, funds allotted for motor-fuel inspection, administration of motor vehicle department, and regulation of motor vehicles, are shown in this column.

[4] Includes funds allotted for expenditure on urban extensions of State highway system, where reported separately from other funds distributed for local roads and streets.

[5] County or local obligations assumed by State as reimbursement for local roads added to State system.

[6] In States indicated by star (*) law provides that allotments for work on local roads or streets may also be used for service of local highway obligations, but amounts so used not reported separately.

[7] In a number of States, allotments for local road work may be used on city streets. This column shows allotments which were reported separately. See note 4.

[8] To State general funds unless otherwise noted. Allocations to county or municipal general funds may have been used in part for highways, but such amounts not reported.

[9] As fees for inspection of gasoline, dealers' license fees, and penalties for infractions of the motor-fuel tax law are not ordinarily regarded as highway revenues, the allocation of such funds to general revenue is shown separately from the allocation of regular motor-fuel tax receipts.

[10] For engineering expenses in connection with irrigation.

[11] Funds allotted to counties for use on both State and local roads.

[12] For county roads under State control.

[13] To division of airways.

[14] For harbor improvement.

[15] To Tolchester Ferry Co.

[16] To Metropolitan District Commission.

[17] Service of nonhighway portion of Emergency Public Works loan, $1,271,000; flood relief and other expenditures for relief, $521,000.

[18] Paid out of motor-vehicle revenue, $3,500. See table pages 140 and 141.

[19] Service of highway relief bonds, a State obligation incurred for improvement of local roads.

[20] Service of institutional construction bonds, $486,000; Department of Commerce and Navigation, $90,000.

[21] Appropriations for highway purposes out of State general fund have been credited against payments of motor-fuel tax and motor-vehicle fees to the general fund and prorated in proportion to net receipts not otherwise dedicated.

[22] To State general fund after crediting appropriations for highway purposes, $37,011,000; New York City general fund, $1,546,000.

[23] Included in cost of collecting motor-vehicle revenue. See table pages 140 and 141.

[24] Ohio imposes a 3-cent tax on motor-vehicle fuel and a 1-cent tax on all liquid fuels. The receipts from the 1-cent tax applicable to nonmotor-vehicle fuels (kerosene, fuel oil, etc.) were $689,000. These receipts have been eliminated from the total given, which represents a 4-cent tax on motor-vehicle fuel.

[25] In cities situated on State highways, one-sixth municipal allotment to be used on urban extensions of State system.

[26] For service of general State debt.

[27] In computing adjustment, amounts loaned to general fund for relief purposes in 1935 and 1936, and not yet repaid, have been included in the undistributed balance.

[28] For aircraft landing fields, $121,000; cooperative work other departments, $49,000.

[29] Estimated.

[30] For payments on real estate bonds.

[31] Service of general fund bonds, $2,421,000; Great Smoky Mountain Park bonds, $242,000; aviation projects, $2,000.

[32] For county roads under State control in all but 3 counties, $5,918,000; transferred to remaining 3 counties, $239,000.

[33] For aviation purposes.

[34] Debt service charges on $10,000,000 emergency relief bond issue prorated in proportion to allotments for State highways, local roads, and nonhighway purposes.

[35] To towns, cities, and villages in lieu of personal property tax formerly imposed on motor vehicles.

[36] Paid out of general revenue. Amount not reported.

DISPOSITION OF STATE MOTOR-VEHICLE RECEIPTS, 1936

[Compiled for calendar year from reports of State authorities]

State	Net total receipts of calendar year	Adjustments due to undistributed balances, etc.[1]	Net total funds distributed[2]	Expenses of collection and administration[3]	For other administrative purposes[4]	For State highway purposes							For local roads and streets[7]				For other highway purposes (park and forest roads, etc.)	For nonhighway purposes				
						Construction, maintenance, and administration[5]	State highway police	Service of State highway obligations				Total for State highway purposes	For work on county and local roads	For work on city streets[8]	Service of local highway obligations	Total		To general funds[9]	For relief of unemployment or destitution	For education	For other purposes	Total
								State highway bonds	State-assumed local obligations[6]	Notes and other short-term loans	Total											
	1,000 dollars	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*
Alabama	4,101	−118	3,983	419		1,240	278	1,321			1,321	2,839						[10] 725				725
Arizona	1,028	16	1,044	190		825	29					854										
Arkansas	2,829		2,829	80		750	87	1,157	736	19	1,912	2,749										
California	21,087	−1,751	19,336	2,177	913	3,283	2,159	4,052			4,052	9,494	*3,399			3,399		[10] 3,353				3,353
Colorado	2,589	−58	2,531	639	60	888	34					922	[11] 910			910						
Connecticut	5,957	211	6,168	827		1,620	325		137		137	2,082	3,259			3,259						
Delaware	1,102	39	1,141	94		587	68	25	185		210	865	[12] 182			182						
Florida	5,546		5,546	416	209															4,921		4,921
Georgia	1,302		1,302	150	49	868			235		235	1,103										
Idaho	2,175	61	2,236	60		316	48					364	*1,812			1,812						
Illinois	19,410	−130	19,280	954	316	6,045	1,421	8,929	63		8,992	16,458	1,353			1,353		199				199
Indiana	9,044	66	9,110	863		3,180	338					3,518	1,409	352		1,761		2,968				2,968
Iowa	10,793	−16	10,777	813		5,145			4,819		4,819	9,964										
Kansas	3,815		3,815	285		2,302	5		266		266	2,573	957			957						
Kentucky	4,591	24	4,615	411	24	2,807	17					2,824	557			557		799				799
Louisiana	4,112	125	4,237	129		2,797	404	687		220	907	4,108										
Maine	3,582	44	3,626	117	9	2,118	100	942			942	3,160	340			340						
Maryland	4,744	−2,311	2,433	345	42	342	322	584			584	1,248		274		274			524			524
Massachusetts	6,795	217	7,012	1,489	35	2,756	95	490			490	3,341	1,071		131	1,202	[13] 279	[14] 666				666
Michigan	19,737	−406	19,331	1,067			250					250	*17,677			17,677		337				337
Minnesota	8,189	41	8,230	406	1,802	1,818	41	2,228	1,824		4,052	5,911						111				111
Mississippi	1,869		1,869	96		187				16	16	203	*1,570			1,570						
Missouri	8,988	42	9,030	500		5,261	114	3,155			3,155	8,530										
Montana	1,730	−96	1,634	74			102					102	1,427	31		1,458						
Nebraska	2,158	32	2,190	86		618	37					655	1,449			1,449						
Nevada	279		279	18		168	3	90			90	261										
New Hampshire	2,635	14	2,649	140	3	2,080	150	4			4	2,234	132		[15] 140	272						
New Jersey	17,851	4,600	22,451	1,107		7,575						7,575	6,445		1,273	7,718	61		5,990			5,990
New Mexico	1,318	94	1,412	213		539						539	180			180		[16] 480				480
New York[17]	46,291	−347	45,944	2,473	93	7,173	775	5,012			5,012	12,960	*9,185			9,185		[18] 21,233				21,233
North Carolina	7,589	−209	7,380	398		1,736	71	2,318	142		2,460	4,267	[12] 2,329			2,329		386				386
North Dakota	1,456	359	1,815	95	20	827	21					848	847			847					[19] 5	5
Ohio	23,256	862	24,118	807		5,359	560					5,919	*17,067			17,067					[20] 325	325
Oklahoma	4,743	60	4,803	713	305	1,550						1,550	*2,235			2,235						
Oregon	2,832	−37	2,795	331		1,222	55	804			804	2,081	*319			319	16	48				48
Pennsylvania	35,331	[21] −87	35,244	1,618		27,099	1,105	3,597			3,597	31,801		1,527		1,527	80				[22] 218	218
Rhode Island	2,596	372	2,968	271		1,332	93	161			161	1,586					16	738	357			1,095
South Carolina	1,876	57	1,933	216		376	155	205	981		1,186	1,717										
South Dakota	1,540	18	1,558	61	27	304						304	1,157			1,157	9					
Tennessee	3,706	1	3,707	195		3,236	209	67			67	3,512										
Texas	17,725	−1	17,724	937	305	5,273	316					5,589	*10,893			10,893						
Utah	976	−48	928	135	11			737			737	737						45				45
Vermont	2,245	−108	2,137	58		1,071	86	307			307	1,464	615			615						
Virginia	5,737	17	5,754	401		4,814	205		334		334	5,353										
Washington	2,980	139	3,119	318		2,658	120					2,778	23			23						
West Virginia	5,832		5,832	189		1,249	24	3,551			3,551	4,824	[12] 819			819						
Wisconsin	12,213	33	12,246	727	164	4,637			1,628		1,628	6,265	3,052	514		3,566	59	[23] 1,465				1,465
Wyoming	541	14	555	12		369	8	166			166	543										
District of Columbia	963	−109	854	95	49													[24] 710				710
Total	359,784	1,726	361,510	24,215	4,436	126,400	10,230	40,589	11,350	255	52,194	188,824	92,670	2,698	1,544	96,912	520	33,597	7,537	4,921	548	46,603

[1] Amounts distributed during the calendar year differ in many cases from actual collections because of undistributed balances and lag between accounts of collecting and expending agencies.

[2] In many States the proceeds of motor-fuel taxes, motor-vehicle fees, and motor-carrier taxes are placed in a common fund from which the distribution is made. In these cases the amounts distributed have been prorated in proportion to the receipts, not otherwise dedicated, from these 3 sources of revenue. See tables pp. 138–139 and 142–143.

[3] Collection expenses in many States include service charges deducted by county and local collectors.

[4] Where reported separately from collection expenses, funds allotted for collection of motor-fuel tax, payments to auto-theft fund, and miscellaneous expenses of motor-vehicle regulation, are shown in this column.

[5] Includes funds allotted for expenditure on urban extensions of State highway system, where reported separately from other funds distributed for local roads and streets.

[6] County or local obligations assumed by State as reimbursement for local roads added to State system.

[7] In States indicated by star (*) law provides that allotments for work on local roads or streets may also be used for service of local highway obligations, but amounts so used not reported separately.

[8] In a number of States allotments for local road work may be used on city streets. This column shows allotments which were reported separately. See note 5.

[9] To State general funds unless otherwise noted. Allocations to county or municipal general funds may have been used in part for highways, but such amounts not reported.

[10] To county and municipal general funds.

[11] Funds allotted to counties for use on both State and local roads.

[12] For county roads under State control.

[13] To metropolitan district commission.

[14] Service of nonhighway portion of Emergency Public Works loan, $473,000; flood relief and other expenditures for relief, $193,000.

[15] Service of highway relief bonds, a State obligation incurred for improvement of local roads.

[16] To State general fund, $180,000; county general funds, $300,000.

[17] Appropriations for highway purposes out of State general fund have been credited against payments of motor-fuel tax and motor-vehicle fees to the general fund and prorated in proportion to net receipts not otherwise dedicated.

[18] To State general fund after crediting appropriations for highway purposes, $16,788,000; New York City general fund, $4,445,000.

[19] To Bureau of Criminal Identification.

[20] Hospitalization of indigent persons injured in motor-vehicle accidents.

[21] In computing adjustment, amounts loaned to general fund for relief purposes in 1935 and 1936, and not yet repaid, have been included in the undistributed balances.

[22] For aircraft landing fields, $156,000; cooperative work other departments, $62,000.

[23] To towns, cities, and villages in lieu of personal property tax formerly imposed on motor vehicles.

[24] To District of Columbia general fund.

DISPOSITION OF STATE MOTOR-CARRIER TAX RECEIPTS, 1936

[Compiled for calendar year from reports of State authorities]

State	Net total receipts of calendar year	Adjustments due to undistributed balances, etc.[1]	Net total funds distributed [2]	Expenses of collection and administration	For State highway purposes						For local roads and streets [5]			For other highway purposes (park and forest roads, etc.)	For nonhighway purposes			
					Construction, maintenance, and administration [3]	State highway police	Service of State highway obligations			Total for State highway purposes	For work on county and local roads	Service of local highway obligations	Total		To general funds [6]	For relief of unemployment or destitution	For education	Total
							State highway bonds	State-assumed local obligations [4]	Total									
	1,000 dollars	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*
Alabama	187	−17	170	42	128					128								
Arizona	150		150	9	136	5				141								
Arkansas	3		3		1		1	1	2	3								
California	2,742	−90	2,652	564	7					7	7		7		2,074			2,074
Colorado	568	−59	509	88	251	10				261	[7] 160		160					
Connecticut	290	−107	183		55			5	5	60					[8] 123			123
Delaware	[9]																	
Florida	263		263	46								204	204		[8] 8		5	13
Georgia	400	−165	235	135	79			21	21	100								
Idaho	122	−8	114	39	49	26				75								
Illinois	[9]																	
Indiana	641	−73	568	132	436					436								
Iowa	500		500	152														
Kansas	1,079		1,079	268	460	107		53	53	620	*348		348					
Kentucky	309	−41	268	39	227	1				228	191		191					
Louisiana	4		4	4							1		1					
Maine	23		23	23														
Maryland	[10]																	
Massachusetts	84		84	66														
Michigan	481	−119	362	106	256					256					18			18
Minnesota	19		19	19														
Mississippi	100	5	105	2							*103		103					
Missouri	551	−470	81	81														
Montana	37	−4	33	33														
Nebraska	[9]																	
Nevada	199	1	200	12	185	3				188								
New Hampshire	3		3	3														
New Jersey	79	36	115		46					46	25	7	32	1		36		36
New Mexico	149	3	152	11	128	13				141								
New York	[9]																	
North Carolina	175		175		43	2	58	4	62	107	[11] 58		58		[1] 10			10
North Dakota	49	−13	36	36														
Ohio	728	−344	384	128	133					133	123		123					
Oklahoma	1,004	−21	983	49	934					934								
Oregon	1,012	−37	975	173	392	30	258		258	680	*102		102	5	15			15
Pennsylvania	5		5		5					5								
Rhode Island	11		11	10	1					1								
South Carolina	126	−32	94	22	65					65								
South Dakota	479	14	493	48	433					433				12	[12] 7			7
Tennessee	323	−5	318	56	202		9		9	211					51			51
Texas	82		82	72	10					10								
Utah	205	−109	96	21	75					75								
Vermont	[9]																	
Virginia	155		155	22	100			7	7	107					26			26
Washington	197		197	197														
West Virginia	72		72		19		53		53	72								
Wisconsin	1,144	−70	1,074	326											748			748
Wyoming	174		174	30	141	3				144								
District of Columbia	213	−1	212												[13] 212			212
Total	15,137	−1,726	13,411	3,064	4,997	200	379	91	470	5,667	1,118	211	1,329	18	3,292	36	5	3,333

[1] Amounts distributed during the calendar year differ in many cases from actual collections because of undistributed balances and lag between accounts of collecting and expending agencies.

[2] In many States the proceeds of motor-fuel taxes, motor-vehicle fees, and motor-carrier taxes are placed in a common fund from which the distribution is made. In these cases the amounts distributed have been prorated in proportion to the receipts, not otherwise dedicated, from these 3 sources of revenue. See tables pp. 138 to 141.

[3] Includes funds allotted for expenditure on urban extensions of State highway system, where reported separately from other funds distributed for local roads and streets.

[4] County or local obligations assumed by State as reimbursement for local roads added to State system.

[5] In States indicated by star (*) law provides that allotments for work on local roads or streets may also be used for service of local highway obligations, but amounts so used not reported separately.

[6] To State general funds unless otherwise noted. Allocations to county or municipal general funds may have been used in part for highways, but such amounts not reported.

[7] Funds allotted to counties for use on both State and local roads.

[8] To cities and towns.

[9] No special taxes on motor carriers reported.

[10] Ton-mile and passenger-mile taxes paid by motor carriers in lieu of registration fees included in motor-vehicle receipts, table pp. 140 and 141.

[11] For county roads under State control.

[12] To cities.

[13] To District of Columbia general fund.

DISPOSITION OF RECEIPTS FROM STATE IMPOSTS ON HIGHWAY USERS, 1936

[Compiled for calendar year from reports of State authorities]

State	Net total receipts of calendar year [1]	Adjustments due to undistributed balances, etc.[2]	Net total funds distributed	Expenses of collection and administration [3]	For State highway purposes							For local roads and streets [6]				For other highway purposes (park and forest roads, etc.)	For nonhighway purposes					
					Construction, maintenance, and administration [4]	State highway police	Service of State highway obligations				Total for State highway purposes	For work on county and local roads	For work on city streets [7]	Service of local highway obligations	Total		To general funds [8]		For relief of unemployment or destitution	For education	For other purposes	Total
							State highway bonds	State assumed local obligations [5]	Notes and other short-term loans	Total							Motor-fuel inspection fees, dealers' licenses, etc.[9]	All other highway user imposts				
	1,000 dollars	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*
Alabama	16,091	−213	15,878	561	5,742	278	2,829			2,829	8,849	5,743			5,743			[10] 725				725
Arizona	5,021	16	5,037	262	3,494	125					3,619	*1,149			1,149						[11] 7	7
Arkansas	12,067	−23	12,044	424	3,043	87	4,694	2,986	77	7,757	10,887	572		84	656		77					77
California	66,837	−1,511	65,326	3,793	31,837	2,159	4,052			4,052	38,048	*14,119	3,939		18,058			[12] 5,427				5,427
Colorado	9,990	−127	9,863	890	5,872	223					6,095	[13] 2,878			2,878							
Connecticut	15,082	−78	15,004	878	9,605	325		814		814	10,744	3,259			3,259			[14] 123				123
Delaware	2,958	39	2,997	106	1,622	187	70	510		580	2,389	[15] 502			502							
Florida	26,126	−15	26,111	1,048	8,360	146		2,846		2,846	11,352	12		5,897	5,909			[16] 2,854		4,926	[17] 22	7,802
Georgia	19,195	−165	19,030	856	9,800			2,659		2,659	12,459	2,814			2,814					2,901		2,901
Idaho	5,993	41	6,034	112	4,036	74					4,110	*1,812			1,812							
Illinois	53,229	−123	53,106	1,706	17,142	1,421	8,929	63		8,992	27,555	*9,011	*7,422		16,433		99	199	4,417	2,697		7,412
Indiana	30,839	−2,864	27,975	1,149	11,065	338					11,403	9,654	2,413		12,067		388	2,968				3,356
Iowa	23,489	−11	23,478	1,066	8,615			8,069		8,069	16,684	*5,728			5,728							
Kansas	14,414	−61	14,353	969	8,660	124		1,000		1,000	9,784	3,600			3,600							
Kentucky	16,177	236	16,413	509	14,436	67					14,503	602			602			799				799
Louisiana	16,323	−814	15,509	227	2,797	404	8,374		220	8,594	11,795								1,576	956	[18] 955	3,487
Maine	8,807	101	8,908	165	5,290	250	2,353			2,353	7,893	850			850							
Maryland	13,665	−2,311	11,354	421	3,449	322	2,118			2,118	5,889	993	2,941	572	4,506				524		[19] 14	538
Massachusetts	25,327	232	25,559	1,640	10,170	350	1,809			1,809	12,329	3,950		484	4,434	[20] 1,030		3,668	[21] 2,458			6,126
Michigan	45,957	−666	45,291	1,314	15,438	250	3,720			3,720	19,408	*24,227			24,227		5	337				342
Minnesota	20,537	−44	20,493	2,340	10,253	233	2,228	1,824		4,052	14,538	*3,421			3,421		83	111				194
Mississippi	11,031	−223	10,808	229	3,092	30	1,761		252	2,013	5,135	*5,426			5,426	18						
Missouri	20,727	−428	20,299	686	12,055	262	7,230			7,230	19,547						66					66
Montana	6,222	−249	5,973	129	4,150	102	134			134	4,386	1,427	31		1,458							
Nebraska	13,478	2	13,480	188	6,212	37					6,249	*4,471	334		4,805				2,233			2,238
Nevada	1,558	1	1,559	33	1,397	25	90	14		104	1,526											
New Hampshire	5,819	13	5,832	146	4,185	150	804			804	5,139	265		[22] 282	547							
New Jersey	37,036	6,068	43,104	1,228	9,672		7,636			7,636	17,308	9,590		1,625	11,215	78			11,414	1,285	[23] 576	13,275
New Mexico	4,877	72	4,949	299	2,413	13	1,564			1,564	3,990	180			180			[24] 480				480
New York [25]	102,000	713	102,713	2,657	12,717	1,374	8,886			8,886	22,977	*17,289			17,289			[26] 59,790				59,790
North Carolina	28,725	−209	28,516	428	6,751	276	9,017	553		9,570	16,597	[15] 9,059			9,059		932	1,500				2,432
North Dakota	3,806	376	4,182	232	2,303	45					2,348	1,597			1,597						[27] 5	5
Ohio	67,434	721	68,155	1,123	23,554	560					24,114	*25,072	6,376		31,448					11,145	28 325	11,470
Oklahoma	18,963	−23	18,940	1,331	8,261						8,261	*5,466			5,466		5				[29] 3,877	3,882
Oregon	13,062	−143	12,919	538	6,137	288	4,038			4,038	10,463	*1,600			1,600	80		238				238
Pennsylvania	84,719	[30] −4,733	79,986	1,875	48,251	1,967	6,404			6,404	56,622	*6,021	2,719		8,740	142			12,219		[31] 388	12,607
Rhode Island	4,837	373	5,210	295	2,428	170	293			293	2,891					29		[32] 1,345	650			1,995
South Carolina	11,697	16	11,713	291	2,343	155	1,242	5,949		7,191	9,689	*1,579			1,579		147	7				154
South Dakota	6,205	29	6,234	301	2,570						2,570	1,157			1,157	75					[33] 2,131	2,131
Tennessee	22,187	−97	22,090	525	5,484	209	5,004	2,372		7,376	13,069	4,842			4,842		938	51			[34] 2,665	3,654
Texas	56,278	−692	55,586	1,866	23,897	316		9,307		9,307	33,520	*10,893			10,893					9,307		9,307
Utah	4,269	−183	4,086	178	2,983	143	737			737	3,863							45				45
Vermont	4,522	−225	4,297	61	2,230	86	640			640	2,956	1,280			1,280							
Virginia	20,606	17	20,623	452	12,886	205		893		893	13,984	[35] 6,157			6,157			26			[36] 4	30
Washington	17,522	141	17,663	539	6,380	120	[37] 112			112	6,612	*7,835	1,644	[37] 91	9,570				[37] 942			942
West Virginia	12,714		12,714	201	3,037	24	8,633			8,633	11,694	[15] 819			819							
Wisconsin	31,385	−1,193	30,192	1,477	11,421			4,010		4,010	15,431	7,517	1,267		8,784	145		[38] 4,355				4,355
Wyoming	2,969	−18	2,951	54	2,017	47	278			278	2,342	555			555							
District of Columbia	3,569	−111	3,458	144									2,382		2,382		10	[39] 922				932
Total	1,066,341	−8,346	1,057,995	37,942	419,552	13,967	105,679	43,869	549	150,097	583,616	224,993	31,468	9,035	265,496	1,597	2,750	85,970	36,438	33,217	10,969	169,344

[1] Includes receipts from (1) motor-fuel taxes, (2) motor-vehicle fees and fines, and (3) special imposts on motor vehicles operated for hire (motor-carrier taxes). See tables, pp. 138 to 143, which give distribution of these 3 classes of receipts separately.

[2] Amounts distributed during the calendar year differ in many cases from actual collections because of undistributed balances and lag between accounts of collecting and expending agencies. Adjustments also include deduction of proceeds of tax on gasoline used in aviation in Idaho, Michigan, Nebraska, Oregon, South Carolina, and Wyoming.

[3] Includes expenses of collection and administration of motor-fuel tax, motor-vehicle fees, and motor-carrier taxes, and miscellaneous expenses of motor-vehicle regulation.

[4] Includes funds allotted for expenditure on urban extensions of State highway system, where reported separately from other funds distributed for local roads and streets.

[5] County or local obligations assumed by State as reimbursement for local roads added to State system.

[6] In States indicated by star (*) law provides that allotments for work on local roads or streets may also be used for service of local highway obligations, but amounts so used not reported separately.

[7] In a number of States allotments for local road work may be used on city streets. This column shows allotments which were reported separately. See note 4.

[8] To State general funds unless otherwise noted. Allocations to county or municipa lgeneral funds may have been used in part for highways, but such amounts not reported.

[9] As fees for inspection of gasoline, dealers' license fees, and penalties for infractions of the motor-fuel tax law are not ordinarily regarded as highway revenues, the allocation of such funds to general revenue is shown separately from the allocation of regular motor-fuel tax receipts.

[10] To county and municipal general funds.

[11] For engineering expenses in connection with irrigation.

[12] To State general fund, $2,074,000; county and municipal general funds, $3,353,000.

[13] Funds alloted to counties for use on both State and local roads.

[14] To cities and towns.

[15] For county roads under State control.

[16] To State general fund, $2,846,000; municipal general funds, $8,000.

[17] To Division of Airways.

[18] For harbor improvement.

[19] To Tolchester Ferry Co.

[20] To Metropolitan District Commission.

[21] Service of nonhighway portion of emergency public works loan, $1,744,000; flood relief and other expenditures for relief, $714,000.

[22] Service of highway relief bonds, a State obligation incurred for improvement of local roads.

[23] Service of institutional construction bonds, $486,000; Department of Commerce and Navigation, $90,000.

[24] To State general fund, $180,000; county general funds, $300,000.

[25] Appropriations for highway purposes out of State general fund have been credited against payments of motor-fuel tax and motor-vehicle fees to the general fund and prorated in proportion to net receipts not otherwise dedicated.

[26] To State general fund after crediting appropriations for highway purposes, $53,799,000; New York City general fund, $5,991,000.

[27] To Bureau of Criminal Identification.

[28] Hospitalization of indigent persons injured in motor-vehicle accidents.

[29] For service of general State debt.

[30] In computing adjustment, $17,556,000 loaned to general fund for relief purposes in 1935 and 1936, and not yet repaid, has been included in the undistributed balance.

[31] For aircraft landing fields, $277,000; cooperative work, other departments, $111,000.

[32] In addition to this amount, $3,675,000, reported as the balance in the general highway fund, Dec. 31, 1935, was reported in 1936 as no longer available for highway purposes. The latter amount represents highway user revenues of prior years, shown in previous tables as allotted for highway purposes.

[33] For payments on real estate bonds.

[34] Service of general fund bonds, $2,421,000; Great Smoky Mountain Park bonds, $242,000; aviation projects, $2,000.

[35] For county roads under State control in all but 3 counties, $5,918,000; transferred to remaining 3 counties, $239,000.

[36] For aviation purposes.

[37] Debt service charges on $10,000,000 emergency relief bond issue prorated in proportion to allotments for State highways, local roads, and nonhighway purposes.

[38] To State general fund, $748,000; towns, cities, and villages in lieu of personal property tax formerly imposed on motor vehicles, $3,607,000.

[39] To District of Columbia general fund.

STATUS OF FEDERAL-AID HIGHWAY PROJECTS

AS OF AUGUST 31, 1937

STATE	COMPLETED DURING CURRENT FISCAL YEAR			UNDER CONSTRUCTION			APPROVED FOR CONSTRUCTION			BALANCE OF FUNDS AVAILABLE FOR NEW PROJECTS
	Estimated Total Cost	Federal Aid	Miles	Estimated Total Cost	Federal Aid	Miles	Estimated Total Cost	Federal Aid	Miles	
Alabama				$1,639,801	$819,900	68.2	$3,744,760	$1,872,375	167.6	$5,154,905
Arizona	$ 694,770	$ 357,298	35.9	1,360,811	991,685	44.4	257,877	171,071	16.3	1,764,484
Arkansas	345,172	345,172	16.7	3,473,291	3,467,581	232.0	263,266	262,938	10.7	2,322,961
California	3,754,489	1,972,143	80.7	5,974,864	3,271,380	104.4	1,409,454	760,009	20.8	2,840,923
Colorado	893,459	499,933	33.0	2,619,223	1,454,599	88.4	124,133	64,552	1.5	2,344,136
Connecticut	362,558	179,076	2.1	579,550	281,943	7.8	82,620	41,310	.2	1,508,572
Delaware				512,312	256,067	19.5	243,905	119,934	14.8	1,107,687
Florida	134,650	67,320	6.6	2,573,372	1,286,686	60.9	397,670	198,835	6.5	2,858,060
Georgia	816,859	408,430	44.0	3,889,503	1,944,736	189.7	1,938,066	969,033	77.8	5,340,635
Idaho	908,435	542,083	70.5	1,482,620	885,910	83.0	655,042	390,486	68.0	1,147,368
Illinois	1,422,380	676,715	42.8	10,333,417	5,146,417	314.4	4,383,223	2,184,900	86.4	2,892,257
Indiana	1,709,942	854,916	36.6	5,439,218	2,719,604	150.4	1,331,848	665,924	26.1	2,106,982
Iowa	795,707	387,048	25.3	6,675,643	2,976,765	201.0	3,382,662	1,554,650	100.6	1,179,284
Kansas	870,736	408,921	35.6	5,177,422	2,573,552	223.1	1,852,464	926,227	97.7	3,376,996
Kentucky	447,254	223,627	10.8	3,965,699	1,932,850	105.6	1,366,728	683,364	83.5	2,817,722
Louisiana	103,036	51,219	2.5	9,357,799	1,255,274	25.0	946,050	401,952	39.5	2,469,714
Maine	634,170	317,085	17.6	2,224,106	1,112,053	58.4	1,142,830	571,415	22.9	278,204
Maryland	180,456	90,228	2.1	1,439,650	719,792	21.7	987,818	493,909	16.8	1,790,879
Massachusetts	10,066	5,033		4,924,270	2,462,135	22.5	604,454	302,226	2.3	2,318,938
Michigan	2,755,300	1,377,650	76.7	6,873,560	3,437,280	162.8	3,787,173	1,815,361	71.0	99,201
Minnesota	1,053,966	526,953	57.8	5,336,438	2,600,130	192.8	1,324,746	447,658	50.1	2,449,506
Mississippi	264,600	132,300	9.6	3,998,590	1,999,230	202.3	1,883,000	940,850	77.6	3,560,644
Missouri	2,605,736	1,283,758	121.4	7,359,634	3,611,718	338.2	3,091,192	1,296,098	126.8	2,586,168
Montana	1,814,791	1,017,339	136.4	2,505,320	1,406,042	154.2	1,261,915	679,449	55.2	2,326,754
Nebraska	731,814	365,907	92.9	4,954,444	2,496,584	493.7	1,290,936	614,084	81.0	2,652,067
Nevada	595,172	515,578	34.9	1,988,379	1,712,184	84.8	105,983	91,865	1.1	1,049,767
New Hampshire	12,936	6,468		589,265	290,644	8.0	256,644	126,901	5.1	1,008,498
New Jersey				2,476,848	1,160,809	22.2	39,430	19,715		2,299,692
New Mexico	782,661	473,854	54.1	2,633,256	1,718,429	146.8	1,187,054	723,913	89.4	715,430
New York	2,597,774	1,281,576	40.6	19,792,281	9,277,416	329.6	2,918,310	1,432,955	46.0	1,979,275
North Carolina	1,334,139	667,070	101.0	4,696,563	2,224,582	274.0	1,670,351	761,155	69.2	3,448,894
North Dakota	543,890	543,890	109.0	790,120	769,610	126.2	486,842	486,842	65.1	3,921,891
Ohio	937,282	461,998	16.2	9,498,290	4,656,274	105.0	1,451,820	725,910	13.4	6,218,678
Oklahoma	946,041	497,135	32.1	3,367,100	1,746,498	136.6	1,301,247	683,208	75.7	3,747,112
Oregon	1,156,664	700,251	53.7	3,578,438	2,141,103	114.9	563,037	323,476	27.4	1,114,302
Pennsylvania	2,762,712	1,373,188	33.9	10,313,435	5,144,002	151.0	3,483,694	1,732,396	51.1	4,473,787
Rhode Island	275,020	137,510	2.8	1,320,196	660,098	16.5	10,890	4,134		902,980
South Carolina	1,010,145	420,200	68.0	5,236,124	2,139,558	280.0	630,496	282,935	40.3	2,014,011
South Dakota	674,302	399,826	46.8	1,745,878	970,716	191.7	1,139,948	630,660	101.1	3,546,060
Tennessee	589,818	294,909	25.7	1,634,344	817,172	50.2	935,240	467,620	32.6	4,936,328
Texas	3,628,267	1,812,886	281.6	10,609,662	5,284,686	615.4	2,595,590	1,292,855	111.2	7,933,732
Utah	119,208	85,202	6.2	1,350,350	970,163	134.1	515,269	353,310	34.1	1,178,379
Vermont	510,922	246,154	12.3	1,306,739	586,863	37.1	253,120	92,429	3.5	323,344
Virginia	556,620	278,310	29.5	3,099,526	1,510,673	96.2	997,241	498,620	42.3	2,601,559
Washington	903,288	474,700	53.8	2,802,362	1,466,326	47.1	484,901	253,043	9.6	1,290,137
West Virginia	384,604	192,302	12.5	1,562,782	781,039	42.6	595,054	372,622	16.1	2,341,316
Wisconsin	3,066,543	1,477,210	88.6	6,388,302	3,043,365	181.5	2,255,891	1,080,900	70.9	1,531,986
Wyoming	573,928	353,948	67.0	2,345,335	1,413,229	259.2	552,020	336,700	46.1	448,232
District of Columbia										
Hawaii	236,496	117,895	4.4	616,749	301,733	12.8	371,350	182,080	5.4	1,227,500
Puerto Rico										625,000
TOTALS	47,508,778	24,902,214	2,132.3	204,412,881	101,897,085	7,027.9	62,555,254	31,384,854	2,278.4	120,172,937

CURRENT STATUS OF UNITED STATES WORKS PROGRAM HIGHWAY PROJECTS

(AS PROVIDED BY THE EMERGENCY RELIEF APPROPRIATION ACT OF 1935)

AS OF AUGUST 31, 1937

STATE	APPORTIONMENT	COMPLETED			UNDER CONSTRUCTION			APPROVED FOR CONSTRUCTION			BALANCE OF FUNDS AVAILABLE FOR NEW PROJECTS
		Estimated Total Cost	Works Program Funds	Miles	Estimated Total Cost	Works Program Funds	Miles	Estimated Total Cost	Works Program Funds	Miles	
Alabama	$ 4,151,115	$ 3,639,922	$ 3,602,858	130.1	$ 408,640	$ 408,640	8.1	$ 80,572	$ 80,572	6.5	$ 59,045
Arizona	2,569,841	3,009,710	2,418,697	188.6	144,128	73,622	7.3				77,522
Arkansas	3,352,061	2,951,502	2,932,664	324.5	380,793	379,276	35.8				40,121
California	7,747,928	7,419,903	7,179,790	253.6	721,829	554,363	10.3				13,775
Colorado	3,395,263	2,505,903	2,459,381	101.0	89,597	89,596	6.0	8,200	8,200		838,086
Connecticut	1,418,709	783,035	732,184	9.5	597,540	579,820	12.9	124,130	64,435	.2	42,270
Delaware	900,310	605,918	580,185	48.9	278,155	278,155	17.9				41,970
Florida	2,597,144	2,511,247	2,448,539	94.7	106,968	106,968	4.3				41,638
Georgia	4,988,967	1,094,740	1,076,584	73.9	1,671,783	1,671,783	94.4	1,297,474	1,297,474	51.2	943,126
Idaho	2,222,747	2,248,945	2,151,909	185.6	49,205	49,131	.3				21,707
Illinois	8,694,009	7,896,767	7,726,978	444.8	887,743	887,743	43.2				79,288
Indiana	4,941,255	4,290,541	4,072,063	180.9	920,670	862,447	57.5				6,745
Iowa	4,991,664	4,741,882	4,441,051	519.8	500,418	491,207	8.5	59,808	57,770	.3	1,636
Kansas	4,994,975	4,311,232	4,270,824	347.3	672,665	670,493	28.9	35,840	35,840	13.9	57,818
Kentucky	3,726,271	3,227,153	3,099,896	344.4	548,005	548,005	13.6				78,370
Louisiana	2,890,429	2,426,574	2,169,478	157.0	660,493	599,816	10.7	112,699	74,701	10.4	46,434
Maine	1,676,799	1,476,926	1,464,500	68.6	187,028	184,429	6.8	27,870	27,870	.7	
Maryland	1,750,738	471,481	464,705	17.6	747,571	747,571	17.4	193,134	159,302	6.4	379,160
Massachusetts	3,262,885	391,467	391,467	4.0	2,609,120	2,218,350	14.4	1,149,906	581,543	.8	71,525
Michigan	6,301,414	6,480,310	5,940,287	287.2	297,637	296,521	4.8	49,900	39,282	.3	25,324
Minnesota	5,277,145	5,898,286	4,920,831	887.3	557,634	332,378	15.3	42,575	23,936	.8	
Mississippi	3,457,552	2,659,690	2,655,872	184.3	698,700	697,660	50.4	40,000	40,000	1.5	64,020
Missouri	6,012,652	4,981,893	4,883,496	770.8	1,118,577	988,205	6.9	34,390	32,294		108,657
Montana	3,676,416	3,432,741	3,421,094	192.8	278,930	237,591	9.9	8,462	8,462		9,269
Nebraska	3,870,739	3,130,686	3,031,142	329.8	605,971	605,968	39.5	226,511	226,511	3.2	7,118
Nevada	2,243,074	2,291,081	2,209,009	110.0	33,646	33,646					419
New Hampshire	945,225	789,220	758,968	34.4	160,072	159,287	5.8				26,970
New Jersey	3,129,805	1,060,687	1,057,687	16.8	2,038,819	2,025,664	18.6	6,110	6,110		40,344
New Mexico	2,871,397	2,605,098	2,600,277	196.2	210,438	210,438	16.0	14,681	12,196		48,486
New York	11,046,377	10,350,071	9,920,008	158.4	543,989	543,989	11.8	130,000	130,000	.5	452,380
North Carolina	4,720,173	3,401,910	3,331,340	227.2	1,335,770	1,335,770	63.5	39,700	39,700	.5	13,363
North Dakota	2,867,245	2,388,075	2,362,829	362.8	197,305	197,249	13.6	292,734	292,734	39.8	14,433
Ohio	7,670,815	5,560,739	5,479,661	216.2	2,007,417	1,973,367	76.3	188,130	182,130	4.2	35,657
Oklahoma	4,580,670	4,140,688	4,042,366	386.6	492,646	492,586	18.6	77,400	35,307	3.8	10,410
Oregon	3,038,642	2,763,204	2,656,321	158.6	513,539	369,706	6.0				12,615
Pennsylvania	9,347,797	3,003,215	2,834,276	145.5	5,626,723	5,268,520	108.9	1,405,621	1,099,888	31.4	145,113
Rhode Island	989,208	1,109,360	986,896	18.8	2,240	2,240					72
South Carolina	2,702,012	2,179,123	2,059,166	220.1	650,935	587,605	29.5	21,242	21,242	1.5	33,998
South Dakota	2,976,454	2,339,531	2,336,310	426.4	614,617	614,617	78.2	9,972	9,972		15,555
Tennessee	4,192,460	2,759,284	2,732,492	114.8	1,185,681	1,185,681	32.6	123,170	123,170	1.2	151,117
Texas	11,989,350	12,609,144	11,546,037	1,106.4	384,461	285,584	5.9	159,161	143,575	13.2	14,155
Utah	2,067,154	1,952,289	1,751,363	190.6	277,275	276,714	17.5	11,021	11,021	.6	28,056
Vermont	924,306	1,016,181	883,048	21.9	49,422	36,400	1.3				4,858
Virginia	3,652,667	3,337,365	3,267,100	1,001.9	180,843	180,843	24.1	58,618	58,506	3.9	146,218
Washington	3,026,161	3,314,896	2,913,200	163.4	85,272	85,272	.9	25,465	20,845	.7	6,844
West Virginia	2,231,412	1,158,692	1,149,044	52.4	1,178,085	1,042,188	42.7	47,560	40,180	5.4	
Wisconsin	4,823,884	5,205,645	4,690,599	337.7	133,855	124,000	6.1	5,025	4,900		4,385
Wyoming	2,219,155	2,188,251	2,182,594	152.4	33,287	33,287					3,274
District of Columbia	949,496	950,000	949,496	8.8							
Hawaii	926,033	623,701	605,700	8.9	334,743	265,689	8.5				54,644
TOTALS	195,000,000	161,685,904	153,842,262	11,984.2	34,010,880	31,850,080	1,111.5	6,107,081	4,989,668	202.9	4,317,990

CURRENT STATUS OF UNITED STATES WORKS PROGRAM GRADE CROSSING PROJECTS

(AS PROVIDED BY THE EMERGENCY RELIEF APPROPRIATION ACT OF 1935)

AS OF AUGUST 31, 1937

STATE	APPORTIONMENT	COMPLETED					UNDER CONSTRUCTION					APPROVED FOR CONSTRUCTION					BALANCE OF FUNDS AVAILABLE FOR NEW PROJECTS
		Estimated Total Cost	Works Program Funds	NUMBER			Estimated Total Cost	Works Program Funds	NUMBER			Estimated Total Cost	Works Program Funds	NUMBER			
				Grade Crossings Eliminated by Separation or Relocation	Grade Crossing Structures Reconstructed	Grade Crossings Protected by Signals or Otherwise			Grade Crossings Eliminated by Separation or Relocation	Grade Crossing Structures Reconstructed	Grade Crossings Protected by Signals or Otherwise			Grade Crossings Eliminated by Separation or Relocation	Grade Crossing Structures Reconstructed	Grade Crossings Protected by Signals or Otherwise	
Alabama	$ 4,034,617	$ 3,041,147	$ 3,040,883	42	1	12	$ 798,172	$ 798,172	6			$ 256,063	$ 195,563	5			$ 14,674
Arizona	1,256,099	1,113,686	1,079,056	13			199,472	162,370	2		3						
Arkansas	3,574,060	2,223,401	2,217,181	41	6	2	1,162,256	1,160,946	14		5	160,159	159,889	1		25	36,045
California	7,486,362	6,627,729	6,394,391	38	8		1,082,369	1,079,589	9			10,000	10,000	5			2,382
Colorado	2,631,567	1,482,761	1,429,513	19	1		881,478	850,333	9			377,010	339,301	3		21	12,420
Connecticut	1,712,684	297,379	297,379	2	1	1	792,481	771,120	5			616,150	596,965	3			47,220
Delaware	418,239	130,000	130,000	1			277,993	277,993	2								10,246
Florida	2,827,883	2,081,687	2,078,968	25	5	2	442,767	441,818	6			71,470	71,470			27	235,626
Georgia	4,895,949	148,437	146,945	4	3	1	1,251,771	1,251,771	26	6	4	1,026,000	1,026,000	16	3	47	2,471,233
Idaho	1,674,479	1,261,824	1,254,540	19	2	9	396,821	396,731	4		8	4,921	4,921			4	18,287
Illinois	10,307,184	7,123,011	7,096,719	57	6		2,998,945	2,998,945	16	2		161,000	161,000		2		50,520
Indiana	5,111,096	3,494,867	3,342,522	31	12		1,730,071	1,730,071	11		163						38,503
Iowa	5,600,679	3,651,048	3,561,663	82	9	7	1,967,638	1,964,911	25			80,407	68,690			1	5,415
Kansas	5,246,258	3,307,564	3,302,561	49		5	1,964,175	1,891,929	9	1		111,090	15,000	2			36,768
Kentucky	3,672,387	1,084,522	1,073,847	14	3		2,234,921	1,945,189	10	7		614,656	601,064	4	2		52,287
Louisiana	3,213,467	1,148,910	1,148,910	12	1		1,207,679	1,207,661	12	1		862,485	660,466	7	1		196,429
Maine	1,426,861	1,010,930	1,008,683	18		2	366,278	366,278	1	2		71,740	24,068	1		2	27,833
Maryland	2,061,751	418,680	418,680	3	3	16	804,729	804,729	4	1	3	617,561	545,093	5	1	7	293,249
Massachusetts	4,210,833	1,533,336	1,533,251	13	3		2,211,531	2,211,531	13	1		249,991	249,991	1			216,060
Michigan	6,765,197	5,981,247	5,787,280	43	6		969,077	898,608	1	2		43,500	43,500		1		35,809
Minnesota	5,395,441	4,146,084	4,027,069	75	11	39	1,365,677	1,354,524	10	2	11						13,849
Mississippi	3,241,475	1,592,932	1,592,768	39	4	2	1,123,568	1,123,568	16	3	5	40,100	40,100			14	485,039
Missouri	6,142,153	1,374,333	1,358,845	19			4,942,291	4,761,400	30	1	1	1,650	1,650			1	20,258
Montana	2,722,327	2,657,848	2,536,243	37	7		245,576	135,931	1	1							153
Nebraska	3,556,441	2,317,725	2,285,558	70	3	17	1,062,479	1,062,479	12		2	219,670	194,632	5		5	13,772
Nevada	887,260	885,820	859,960	8	3		13,308	13,308				3,630	3,630			5	10,362
New Hampshire	822,484	476,747	476,747	5	4		317,463	317,396	4		2	52,468	28,341	1		5	
New Jersey	3,983,826	1,017,054	1,017,054	9	2	1	2,646,639	2,635,594	13	7		291,410	291,410	2	1		39,768
New Mexico	1,725,286	1,678,000	1,672,314	18	1		25,879	25,879				56,505	11,202	1			15,891
New York	13,577,189	8,315,865	8,069,841	25	32		5,264,660	5,236,160	20	17		94,000	94,000				177,188
North Carolina	4,823,958	2,885,299	2,884,724	39	17		1,311,593	1,292,042	18	1	108	484,680	484,680	4			162,512
North Dakota	3,207,473	1,970,338	1,965,783	38	2		1,241,606	1,241,606	13	3							84
Ohio	8,439,897	1,441,897	1,364,395	9	3	2	5,852,726	5,494,403	36	5	1	1,284,879	1,184,174	12			396,925
Oklahoma	5,004,711	3,180,739	3,173,220	51	7	3	1,597,721	1,502,721	13	3	3	348,820	310,720	1	2	35	18,050
Oregon	2,334,204	2,239,057	2,154,389	15	6	2	177,027	174,122	2								5,693
Pennsylvania	11,483,613	3,872,046	3,512,325	46	14	9	8,053,908	7,534,712	36	9		150,000	150,000	4			286,575
Rhode Island	699,691	653,760	652,694	4	2		44,314	44,314		1							2,683
South Carolina	3,059,956	1,309,793	1,290,802	26	8	4	1,183,239	1,154,008	18	6	22	213,307	213,307	1	1	22	401,839
South Dakota	3,249,086	1,729,572	1,728,885	36	5	39	1,287,909	1,287,909	27	1	14	281,170	222,212	19			10,080
Tennessee	3,903,979	865,784	856,101	16	3	22	2,533,590	2,533,590	29		3	253,550	253,550	1	1	14	260,738
Texas	10,855,982	8,969,804	8,958,446	117	13	60	1,224,393	1,224,390	9	2	5	382,758	370,914		1	84	302,232
Utah	1,230,763	657,159	655,754	9	1	1	563,864	563,864	8								11,145
Vermont	729,857	561,433	534,633	7	6	17	1,204,133	187,274	3	1	3						7,950
Virginia	3,774,287	2,349,255	2,239,385	39	15	13	1,096,564	1,089,939	9	4		417,340	415,326	2	2	11	29,636
Washington	3,095,041	2,469,207	2,434,480	21	11	8	645,948	645,524	2	1	1	4,562	4,562			2	10,476
West Virginia	2,677,937	266,614	266,614	3		4	2,308,846	2,306,878	20	4	1	27,947	27,947	3		2	76,498
Wisconsin	5,022,683	3,601,206	3,565,228	33	5		1,426,581	1,426,537	4	2		68,667	29,367			19	1,550
Wyoming	1,360,841	886,875	886,767	10			467,369	467,368	4								6,706
Dist. of Columbia	410,804	417,779	410,804	3													
Hawaii	453,703	293,667	292,776	3			226,162	158,370	2								2,556
TOTALS	196,000,000	112,245,858	110,067,576	1356	255	300	73,195,657	70,256,505	544	97	368	10,011,316	9,104,705	109	18	353	6,571,214

PUBLICATIONS of the BUREAU OF PUBLIC ROADS

Any of the following publications may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D. C. As his office is not connected with the Department and as the Department does not sell publications, please send no remittance to the United States Department of Agriculture.

ANNUAL REPORTS

Report of the Chief of the Bureau of Public Roads, 1924. 5 cents.

Report of the Chief of the Bureau of Public Roads, 1927. 5 cents.

Report of the Chief of the Bureau of Public Roads, 1928. 5 cents.

Report of the Chief of the Bureau of Public Roads, 1929. 10 cents.

Report of the Chief of the Bureau of Public Roads, 1931. 10 cents.

Report of the Chief of the Bureau of Public Roads, 1933. 5 cents.

Report of the Chief of the Bureau of Public Roads, 1934. 10 cents.

Report of the Chief of the Bureau of Public Roads, 1935. 5 cents.

Report of the Chief of the Bureau of Public Roads, 1936. 10 cents.

DEPARTMENT BULLETINS

No. 583D..Reports on Experimental Convict Road Camp, Fulton County, Ga. 25 cents.

No. 1279D..Rural Highway Mileage, Income, and Expenditures, 1921 and 1922. 15 cents.

No. 1486D..Highway Bridge Location. 15 cents.

TECHNICAL BULLETINS

No. 55T. . .Highway Bridge Surveys. 20 cents.

No. 265T...Electrical Equipment on Movable Bridges. 35 cents.

MISCELLANEOUS PUBLICATIONS

No. 76MP..The Results of Physical Tests of Road-Building Rock. 25 cents.

No. 191MP.Roadside Improvement. 10 cents.

No. 272MP.Construction of Private Driveways. 10 cents.

No. 279MP.Bibliography on Highway Lighting. 5 cents.

Federal Legislation and Rules and Regulations Relating to Highway Construction. 15 cents.

The Taxation of Motor Vehicles in 1932. 35 cents.

An Economic and Statistical Analysis of Highway-Construction Expenditures. 15 cents.

Highway Bond Calculations. 10 cents.

Single copies of the following publications may be obtained from the Bureau of Public Roads upon request. They cannot be purchased from the Superintendent of Documents.

SEPARATE REPRINT FROM THE YEARBOOK

No. 1036Y..Road Work on Farm Outlets Needs Skill and Right Equipment.

TRANSPORTATION SURVEY REPORTS

Report of a Survey of Transportation on the State Highway System of Ohio (1927).

Report of a Survey of Transportation on the State Highways of Vermont (1927).

Report of a Survey of Transportation on the State Highways of New Hampshire (1927).

Report of a Plan of Highway Improvement in the Regional Area of Cleveland, Ohio (1928).

Report of a Survey of Transportation on the State Highways of Pennsylvania (1928).

Report of a Survey of Traffic on the Federal-Aid Highway Systems of Eleven Western States (1930).

UNIFORM VEHICLE CODE

Act I.—Uniform Motor Vehicle Administration, Registration, Certificate of Title, and Antitheft Act.

Act II.—Uniform Motor Vehicle Operators' and Chauffeurs' License Act.

Act III.—Uniform Motor Vehicle Civil Liability Act.

Act IV.—Uniform Motor Vehicle Safety Responsibility Act.

Act V.—Uniform Act Regulating Traffic on Highways.

Model Traffic Ordinances.

A complete list of the publications of the Bureau of Public Roads, classified according to subject and including the more important articles in PUBLIC ROADS, may be obtained upon request addressed to the U. S. Bureau of Public Roads, Willard Building, Washington, D. C.

CURRENT STATUS OF UNITED STATES PUBLIC WORKS ROAD CONSTRUCTION

AS PROVIDED BY SECTION 204 OF THE NATIONAL INDUSTRIAL RECOVERY ACT (1934 FUNDS) AND BY THE ACT OF JUNE 18, 1934 (1935 FUNDS)

AS OF AUGUST 31, 1937

STATE	APPORTIONMENTS		COMPLETED				UNDER CONSTRUCTION				APPROVED FOR CONSTRUCTION			BALANCE OF FUNDS AVAILABLE FOR NEW PROJECTS	
	Sec. 204 of the Act of June 16, 1933 (1934 Fund)	Act of June 18, 1934 (1935 Fund)	Total Cost	1934 Public Works Funds	1935 Public Works Funds	Mileage	Estimated Total Cost	1934 Public Works Funds	1935 Public Works Funds	Mileage	1934 Public Works Funds	1935 Public Works Funds	Mileage	1934 Public Works Funds	1935 Public Works Funds
Alabama	$ 8,370,133	$ 4,259,842	$ 15,768,209	$ 8,305,736	$ 3,882,233	772.7	$ 72,922	$ 55,922	$ 17,000	3.9		$ 288,105	1.5	$ 8,475	$ 72,504
Arizona	5,211,960	2,641,935	9,036,003	5,205,763	2,616,771	537.0	19,573		19,573					6,197	5,591
Arkansas	6,748,335	3,428,049	11,094,422	6,714,187	3,409,259	626.4	47,750	33,944	13,586	10.9		3,200		204	2,005
California	15,607,354	7,932,206	30,592,038	15,607,354	7,738,760	763.9	114,733		109,877						83,569
Colorado	6,874,530	3,486,006	11,269,838	6,874,530	3,465,039	633.2	11,000		11,000						9,967
Connecticut	2,865,740	1,454,868	4,595,978	2,817,886	1,347,956	74.1	153,800	47,854	95,119	1.5					11,793
Delaware	1,819,088	923,395	2,782,832	1,818,804	916,149	128.9	8,210	284	7,246						
Florida	5,231,834	2,661,343	9,034,121	5,175,534	2,414,418	307.3	289,764	56,300	233,464	2.9					13,461
Georgia	10,091,185	5,113,491	13,873,270	9,412,325	3,589,643	794.7	905,006	237,969	667,037	41.0	$ 212,443	645,290	15.3	228,448	211,522
Idaho	4,486,249	2,277,486	7,125,725	4,486,249	2,199,313	501.5	74,779		49,236	1.9		11,428			17,508
Illinois	17,570,770	8,921,401	26,829,947	17,466,134	8,103,371	745.7	866,859	74,400	764,459	1.3		28,100	9.3	30,236	25,471
Indiana	10,037,843	5,088,963	15,749,737	10,017,034	4,861,544	485.1	52,340		52,340			58,728		20,809	116,352
Iowa	10,055,660	5,118,361	15,790,338	10,055,660	5,118,361	1,227.3									
Kansas	10,089,604	5,117,675	15,469,336	10,089,029	5,052,747	1,144.2	72,137		43,698	1.3				574	21,231
Kentucky	7,517,359	3,818,311	12,206,450	7,480,082	3,744,977	814.7	39,626		39,626	.8	11,306	17,973		25,971	15,735
Louisiana	5,828,591	2,963,932	9,132,363	5,755,288	2,688,031	258.9	395,131		235,959	18.4				73,303	39,942
Maine	3,369,917	1,711,586	5,329,092	3,363,872	1,702,680	195.0						8,644		6,045	262
Maryland	3,564,527	1,810,058	5,730,480	3,471,009	1,113,025	153.7	264,571	28,053	232,168	1.8	35,923	277,700	6.0	29,542	187,165
Massachusetts	6,597,100	3,350,474	10,510,393	6,550,778	3,139,337	115.5						91,944	.1	46,322	119,193
Michigan	12,736,227	6,452,568	20,772,274	12,736,227	6,295,890	768.1	179,788		136,788	.4					19,890
Minnesota	10,656,569	5,425,551	16,344,292	10,567,633	4,917,972	1,647.4	439,238		410,723	2.6	50,020			38,916	96,856
Mississippi	6,978,675	3,540,227	13,091,450	6,785,737	3,295,243	726.2	343,052	125,000	206,158	19.3	36,115	9,000	1.2	31,822	29,826
Missouri	12,180,306	6,173,740	18,317,246	12,119,584	5,136,421	1,446.4	984,283		984,283	1.1				60,722	53,036
Montana	7,439,748	3,769,734	11,764,611	7,425,285	3,655,874	1,058.4	131,534	6,905	57,239	.2				7,558	56,621
Nebraska	7,828,961	3,964,364	13,080,739	7,812,918	3,856,568	1,044.8	139,099	16,043	88,400	10.7					19,396
Nevada	4,545,917	2,302,356	7,073,517	4,545,917	2,266,964	758.8	21,979		21,979						13,413
New Hampshire	1,909,839	969,462	3,007,927	1,904,951	955,186	78.3								4,889	14,276
New Jersey	6,346,039	3,220,879	9,223,863	6,165,750	2,455,730	88.4	1,197,850	99,977	663,430	8.6	79,589	23,874	.5	723	77,844
New Mexico	5,792,935	2,941,700	8,912,013	5,748,150	2,922,863	750.0	55,585	29,694	10,800	1.2		2,695		15,091	5,342
New York	22,330,101	11,327,921	40,581,056	22,228,884	11,014,795	825.1	192,932	6,831	59,900	.1	6,600	124,900		87,786	128,326
North Carolina	9,522,293	4,840,941	15,320,720	9,364,174	4,721,698	1,357.6	238,501	143,020	93,171	40.9	5,960	8,200		9,139	17,872
North Dakota	5,804,448	2,938,967	8,927,781	5,736,109	2,406,584	2,151.7	112,386		112,386	14.9		199,691	3.9	68,339	220,305
Ohio	15,484,592	7,865,012	24,843,973	15,426,422	7,548,533	795.4	362,122	50,000	245,975	4.9				8,170	70,504
Oklahoma	9,216,798	4,685,180	14,782,680	9,214,165	4,449,353	806.6	232,864		232,663	.4				2,633	3,164
Oregon	6,106,896	3,097,814	10,077,336	6,102,835	2,963,472	469.5	46,467		46,467					4,062	87,875
Pennsylvania	18,891,004	9,590,788	29,418,947	18,589,519	9,130,548	1,057.9	743,047	256,582	421,025	13.5	12,000		1.0	32,903	39,215
Rhode Island	1,998,708	1,014,572	3,150,270	1,998,708	1,012,094	89.1	2,478		2,478						
South Carolina	5,459,165	2,770,954	8,221,105	5,368,486	2,519,597	625.8	277,234	217	242,149	10.6	40,000		.5	50,462	9,208
South Dakota	6,011,479	3,047,643	9,487,391	5,964,617	2,943,477	1,614.1	101,151	21,920	72,631	8.2	4,870	260	6.2	20,072	31,275
Tennessee	8,492,619	4,302,991	13,915,252	8,492,551	4,302,972	504.3								68	19
Texas	24,244,024	12,291,253	38,055,068	24,200,959	11,938,719	2,782.4	338,328	2,797	335,531	.4		2,050		40,268	14,953
Utah	4,194,708	2,132,691	7,459,642	4,194,708	2,132,691	590.9									
Vermont	1,867,573	948,007	3,180,278	1,867,573	948,007	141.0									
Virginia	7,416,757	3,765,387	11,591,319	7,326,822	3,381,572	629.1	232,166	26,448	200,086	20.7	38,186	171,333	22.8	25,301	12,396
Washington	6,115,867	3,106,412	9,407,780	6,112,042	3,020,316	303.0	46,596		46,596					3,825	39,500
West Virginia	4,474,234	2,280,335	6,457,136	4,308,274	1,804,365	212.9	378,997	54,892	301,059	9.1		168,139	1.7	111,068	6,772
Wisconsin	9,724,881	4,941,837	15,435,518	9,724,881	4,860,251	619.6	40,860		40,860			16,475			24,251
Wyoming	4,501,327	2,287,712	6,907,387	4,476,017	2,212,298	1,040.2	57,140	24,635	32,505	12.0		23,700	.9	675	19,208
District of Columbia	1,918,469	973,842	2,892,447	1,918,469	973,842	22.3									
Hawaii	1,871,062	949,778	3,142,645	1,857,812	725,649	54.8	175,648		172,480	1.1	13,250	26,799			24,850
TOTALS	394,000,000	200,000,000	636,764,235	390,953,433	187,873,158	35,339.9	10,459,526	1,399,687	7,829,150	266.6	546,262	2,208,228	70.9	1,100,618	2,089,464